SERVICE MANUAL SD930

marantz®

model SD930

Stereo Cassette Deck

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Telex: 132.332

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MARANTZ COMPANY, Inc.
National Service Department
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All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

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M/99

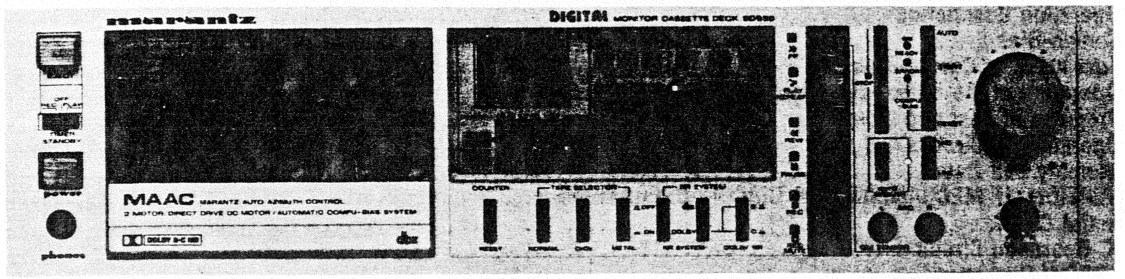
TABLE OF CONTENTS

Section Title Page

1 SHOCK, FIRE HAZARD SERVICE TEST 1
2. P.W. BOARDS 1
3. TEST EQUIPMENT REQUIRED FOR SERVICING 2
4. SD930 COMPU-BIAS SYSTEM 2
  4.1 Features 2
  4.2 Operation Description 2
  4.3 Compu-Bias 5
  4.4 Test Items of Compu-Bias 5
  4.5 Operation of the Compu-Bias Microprocessor 9
  4.6 Progress of Test and Indicator 11
  4.7 Operation of Circuits 11
  4.8 Memory and Data 15
5. DESCRIPTION OF MECHANISM AND CIRCUIT OPERATIONS 15
  5.1 Initial Check 15
  5.2 IC Operation Circuit 15
  5.3 FF/REW Operation 15
  5.4 Play Operation 15
  5.5 Stop Operation 16
  5.6 Rec Operation 16
  5.7 Pause Operation 16
  5.8 Skip Circuit 16
  5.9 Multing 17
  5.10 Checking Voltage Output at Pins of QU01 19
  5.11 Operating Principles of the SD930 System 21
6. MARANTZ AUTOMATIC AZIMUTH CONTROL SYSTEM (M.A.A.C) 22
  6.1 Operational Description 22
  6.2 MAAC Head Description 23
  6.3 Circuit Description 23
7. DISASSEMBLY 28
  7.1 Removing the Top Cover 28
  7.2 Removing the Front Panel 28
  7.3 Removing the Cassette Escutcheon 28
  7.4 Removing the Cassette Mechanism 28
  7.5 Removing the Main P.W. Board 28
8. MECHANICAL ADJUSTMENT 29
  8.1 F/R Motor Pulley Position 29
  8.2 Adjustment of the Head Position During Cue/Rec 29
  8.3 Play Take-Up Torque 29
9. ELECTRICAL ADJUSTMENTS 30
  9.1 Head Azimuth Adjustment 30
  9.2 Tape Speed Adjustment 31
  9.3 playback Output Level Adjustment 31
  9.4 Playback Equalizer Adjustment 32
  9.5 Level Peak Level Meter Adjustment 32
  9.6 Adjustment of Compu-Bias 32
  9.7 MPX Filter Adjustment 34
10. VOLTAGE CONVERSION 35
11. DIAGRAMS 36
  11.1 Level Diagrams 36
  11.2 Block Diagrams (Audio) 37
  11.3 Wiring Diagrams 38
12. EXPLODED VIEWS AND PARTS LIST 44
  [C01-99] Front Panel 44
  [C02-99] Lid (Top & Bottom Cover) 45
  [C03-99] rear Panel 46
  [P01-99] Front Chassis 48
  [P02-99] Associated Mechanism for Cassette Tape Operation 49
  [P03-99] Parts Assembled on Top of Chassis 50
  [P04-99] Parts Assembled on Reverse of Chassis 51
  [H01-99] Packing Materials 52
  Electrical Parts List 53
13. TECHNICAL SPECIFICATIONS 68

M2360

MARANTZ MODEL SD930 CASSETTE DECK



INTRODUCTION

This service manual are prepared for use by Authorized Warranty Station and contains service information for Marantz Stereo Cassette Deck.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of the operation of the Cassette Deck.

The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A simple description is included for parts which can be usually obtained through local suppliers.

1. SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before return to user/customer.

Ref. UL Standard NO. 1270. Para. 66. 3. D (Mandatory Test after servicing Electrical Appliances, effective 7-1-83).

2. P.W. BOARDS

As can be seen from the circuit diagram, the chassis of your Cassette Deck consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1.	Dolby B/C NR	mounted on P.W. Board P601
2.	Power Supply	mounted on P.W. Board P801
3.	dbx	mounted on P.W. Board P901
4.	Rec Volume	mounted on P.W. Board PE01
5.	Main Amp	mounted on P.W. Board PJ01
6.	Head Phone	mounted on P.W. Board PJ02
7.	Auto Bias and EQ	mounted on P.W. Board PQ01
8.	Auto Bias Key Switch	mounted on P.W. Board PQ02
9.	Auto Sub	mounted on P.W. Board PQ03
10.	Timer Switch	mounted on P.W. Board PU01
11.	Key Switch	mounted on P.W. Board PY01
12.	Output Volume	mounted on P.W. Board PE02
13.	Meter	mounted on P.W. Board PX01
14.	Tape Counter	mounted on P.W. Board PR01
15.	Counter Reset Switch	mounted on P.W. Board PR02
16.	LED Indicator	mounted on P.W. Board P503
17.	MAAC 4ch EQ Amp	mounted on P.W. Board P505
18.	MAAC Main	mounted on P.W. Board P501
19.	MAAC Switch and Meter	mounted on P.W. Board P502
20.	MAAC Switch and LED	mounted on P.W. Board P504

M2361

3. TEST EQUIPMENT REQUIRED FOR SERVCING

For measuring or checking your Cassette Deck, the following instrkuments and materials are necessary.

- VTVM
- Audio Oscillator (AF OSC)
- Attenuator (600 Ω)
- Oscilloscope
- Bandpass Filter (1 kHz)
- IEC A-Curve Filter
- Wow and Flutter Meter
- Torque Meter (Cassette Type)
- Digital Frequency Counter
- Distortion Meter
- Blank Tapes (Completely erased with bulk eraser)
  TDK AC-212 (Normal)
  TDK AC-512 (Special/CrO2)
  TDK AC-711 (Metal)

NOTE: If any doubt is noted in a measured value, use new tape.

• Test Tapes	(New Tape)
MTT-111	Wow and Flutter, Tape Speed
MTT-112	Measurements of Output Level
MTT-112B	Signal-to-Noise Ratio
MTT-150	Adjustment of Output Level
MTT-256	Frequency Response (for Normal)
MTT-356	Frequency Response (for Special/ CrOs, Fe-C2 and Metal)
MTT-121	Cross Talk
MTT-141	Channel Separation

M2362

4. SD930 COMPU-BIAS SYSTEM

4.1 FEATURES

1. Fine setting with microprocessor

a. Each item is adjusted in 25dB steps, allowing for fine settings.

b. The recording bias current, recording sensitivity, middle range recording equalization and high range recording equalization are adjusted to the best point.

2. Performance oriented design

a. The recording bias is determined not with frequency response, but peak bias at 1kHz. If the recording bias is determined with the frequency response, distortion increases and MOL (Maximum Output Level) decreases. With the peak bias at 1kHz, the best point between the frequency response and distortion can be found.

b. When adjusting the recording sensitivity and middle and high range equalization, the output level does not fluctuate and a flat frequency response can be obtained, producing the best Dolby NR effect.

3. 6 data memories

a. The tape selector settings (Normal, CrO2, Metal)—factory set using reference tapes — are maintained with a built-in lithium battery even when the power switch is turned OFF.

b. The auto memory contents obtained by the auto setting operation are also backed up and recalled by simply pressing the AUTO key.

4. Perfect error treatment

There are two performance check points in each setting procedure to perform fine setting. If an error is detected at the check point, the setting procedure returns to the first recording bias setting. If the error occurs again, the unit returns to the beginning of the auto start setting, ERROR is indicated for 15 seconds, the unit is reset and the fixed memory contents which were factory set using reference tapes are recalled. These procedures are automatically carried out by the microprocessor. If recording equalization which tends to fluctuate at 15kHz cannot be compensated, the recording equalization is set to the nearest point, to prevent unnecessary error.

4.2. OPERATION DESCRIPTION

1. Adjustment start

a. When the AUTO key is depressed, the unit detects whether the recording lock-out tab in the cassette is removed or not. If the recording lock-out tab is removed, the AUTO key does not function. When the recording lock-out tab is not removed, the ON LED lights up and data memory is changed to auto memory.

b. When the START key is depressed, the unit enters the recording mode and the starting point is memorised. The AUTO ON LED starts flickering to indicate that the auto setting procedure has been started.

c. At the same time as the auto setting procedure starts, the audio mute signal is output and all the adjusting signals are muted. The rec mute circuit is also controlled.

d. During auto setting operation, the mechanism control microprocessor is controlled and the mechanism keys cannot be operated. To release the auto setting operation, press RESET key. The tape is rewound and the unit stops at the auto setting operation start position. The contents of the fixed memory are recalled.

e. The rec input is changed from the mic/line to built-in audio oscillator and a signal of 1kHz is input. The frequency response control level and the Dᗡ level at 1kHz, 7kHz and 15kHz are set to −20dB.

f. The recording/playback output level with 1kHz input signal is detected and the unit detects that the tape is not a leader tape. If the leader tape is detected, the unit continues to record for 10 seconds to find a magnetic tape. If the magnetic tape cannot be detected and the reel pulse (take up reel: 4 pulse/rotation) stops, the unit senses that the tape has reached its end, the ERROR is indicated and unit stops.

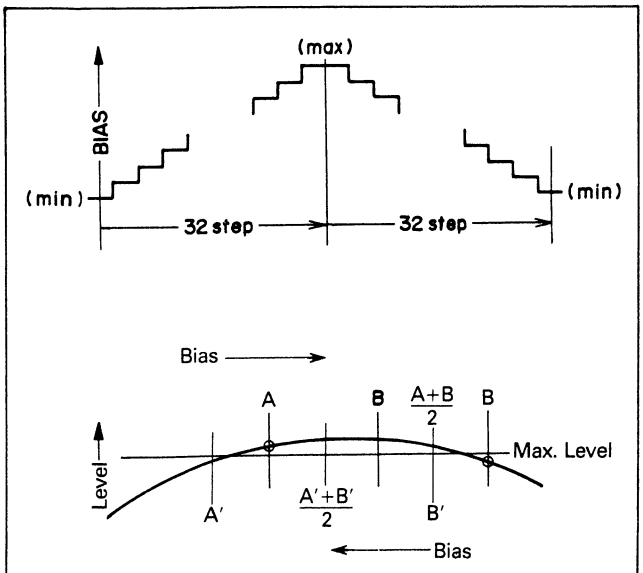
g. The ERROR indicator lights for 15 seconds and stops and the unit enters the RESET mode. The contents of the fixed memory are recalled. In this case, the tape is not rewound.

h. With the 1kHz signal detection, the recording bias, recording sensitivity and recording equalization are not adjusted. They are set to the center points and recording is carried out. Therefore, the evaluation level has some range.

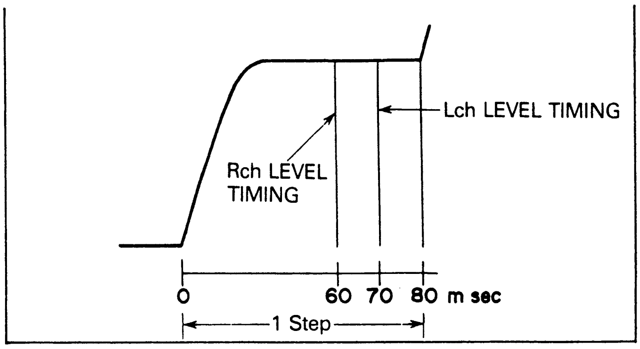
2. Bias adjustment

a. With the 1kHz signal, the peak bias setting is carried out. If the bias is adjusted with the frequency response, a distortion will occur and the best MOL cannot be obtained.

b. The test signal at 1kHz is divided into 32 steps (a total of 64 steps) with a range of ±60% from the average value of the recording bias current. Each step equals 80msec.



Real Peak Bias Point = 1/2 (A+B/2 + A'+B'/2)



c. At the same time as the recording bias is changed, the recording/playback output is observed and the maximum point (A) of the output level and 1 down point (B) after the maximum point are read and the mean value (A + B)/2 is obtained. This procedure is performed twice on both L and R channels and the two independent mean values are obtained.

d. Recording bias ERROR
If the peak point cannot be found at the first attempt (no down point after maximum level), the setting procedure is repeated again.
If the peak point cannot be found at the second attempt, ERROR is indicated.
- The ERROR indicator lights.
- The tape is rewound and stops at the auto setting start point.
- The ERROR indicator stops lighting after 15 seconds and the unit enters the rest mode. The auto ON indicator goes off. (The contents in the fixed memory are recalled.)

3. Recording sensitivity and recording equalization adjustment

a. After the recording bias is adjusted, the recording/playback sensitivity at 1kHz and recording equalization at 1kHz are compared with those at 7kHz and 15kHz. The reference level (Dᗡ level −20dB) is memorised in the microprocessor and recording compensation is carried out referring to this level. The reading is carries out as follows:
- The equalization at 1kHz, 7kHz and 15kHz is recorded with 16 step center values.
- The step reference between the recording/playback output level and reference signal is obtained.
- The recording compensation is changed according to the obtained value and the second recording is carried out.
- The difference is obtained between the reference signal and second signal.
- The recording compensation is changed according to the second obtained value and the third recording is carried out.
- The difference between the third obtained value and the reference signal is obtained and the final step value is memorised.

b. Adjustment
The L and R bias current setting differs and is carried out as follows:
The setting is carried out three times as 1 step 80msec at 1kHz, 7kHz and 15kHz.

M2363

① Lch	1KHz	1st		⑩ Rch	1KHz	1st	
② Lch	7KHz	1st		⑪ Rch	7KHz	1st	
③ Lch	15KHz	1st		⑫ Rch	15KHz	1st	
④ Lch	1KHz	2nd		⑬ Rch	1KHz	2nd	
⑤ Lch	7KHz	2nd		⑭ Rch	7KHz	2nd	
⑥ Lch	15KHz	2nd		⑮ Rch	15KHz	2nd	
⑦ Lch	1KHz	3rd		⑯ Rch	1KHz	3rd	
⑧ Lch	7KHz	3rd		⑰ Rch	7KHz	3rd	
⑨ Lch	15KHz	3rd		⑱ Rch	15KHz	3rd	

c. Evaluation

The evaluation of each channel is carried out as follows:

(1kHz, 7kHz): The last memory step value other than at both edges is correct.

(15kHz): A final evaluation is not carried out. An approximate value is correct. This is why there is no large error after adjustment at 7kHz. The commercially available no-brand tapes tend to fluctuate at 15kHz. Then the ERROR indicator lights up and the fixed memory is recalled. With the auto setting procedure, the high frequency is increased to some extent and better recording may result.

d. ERROR indication

- When the last memory value at 1kHz and 7kHz is 0 or 31, the unit determines that this is an error and returns to the beginning of bias current adjustment.
- If the error occurs again, the ERROR indicator lights up again.
  (1) The ERROR indicator lights.
  (2) The tape is rewound and stops at the beginning of auto setting operation point.
  (3) The ERROR indicator stops lighting after 15 seconds and the unit enters reset mode. The auto ON indicator goes off. (The contents of the fixed memory are recalled.)

e. Final tape detection

- After setting the tape equalization, the tape is finally checked.
- When everything is OK, the READY indicator turns ON.
- The tape is automatically rewound and the unit searches the auto operation start point.
- A 4-second non-recorded section is provided from the auto setting start point and the unit enters rec pause mode.

4. Notes on auto bias and equalization setting

a. Start condition

To start the auto setting operation, the unit should be in the stop mode and the cassette can be recorded. If the auto setting operation does not start even when the auto START key is depressed, check the following.

(1) Immediately after the tape transport mechanism stops. (To change the priority order of mechanism and auto setting microprocessors, the auto setting microprocessor does not work for about 2 seconds.)
(2) Whether the mechanism is in the mode other than stop or pause.
(3) Whether the tape is not loaded correctly.
(4) Whether the recording lock-out tab of the cassette is removed.

b. Auto setting operation stop

During auto setting operation, the auto setting microprocessor has a priority over the mechanism microprocessor and none of tape transport keys can be operated. To stop the auto setting operation, depress the RESET key. The unit returns to the auto setting start point and stops. If the tape selector switch is operated during auto setting operation, the unit detects an error, returns to the auto setting start point and stops. Carry out the auto setting with the tape selector switch set correctly.

c. When error occurs

If an error occurs, check the following again:

(1) Whether tape selector switch is set correctly.
(2) Whether the tape is in the head position.
(3) Whether the tape is very low grade or old. The auto setting operation sometimes cannot be carried out at the beginning or end of the tape. Carry out the auto setting in the tape inside as possible.

d. Ready

When the auto setting is completed, the tape is automatically rewound to the auto setting start point, the READY indicator lights up, a 4-second non-recorded section is provided and the unit enters rec pause mode. When the READY indicator lights up, the auto setting is completed and the tape transport keys can be operated.

5. Data memory

Three kinds of recording bias, recording sensitivity and recording equalization obtained from auto setting procedure are memorised according to the tape selector switch settings and backed by the built-in lithium battery even when the power switch is turned off. The stored data can be recalled as follows.

(1) The factory set data using reference tapes is recalled when the power switch is turned on.
(2) The data obtained from the auto setting operation is memorised in the auto memory. Each time the auto setting operation is carried out, the data in the auto memory is renewed.
(3) When the power switch is turned on and AUTO key is depressed, the auto ON LED lights up and the data in the auto memory is recalled. In this condition, recording with auto memory data is possible.
(4) To recall the fixed memory data, depress RESET key.

m2364

4.3 COMPU-BIAS

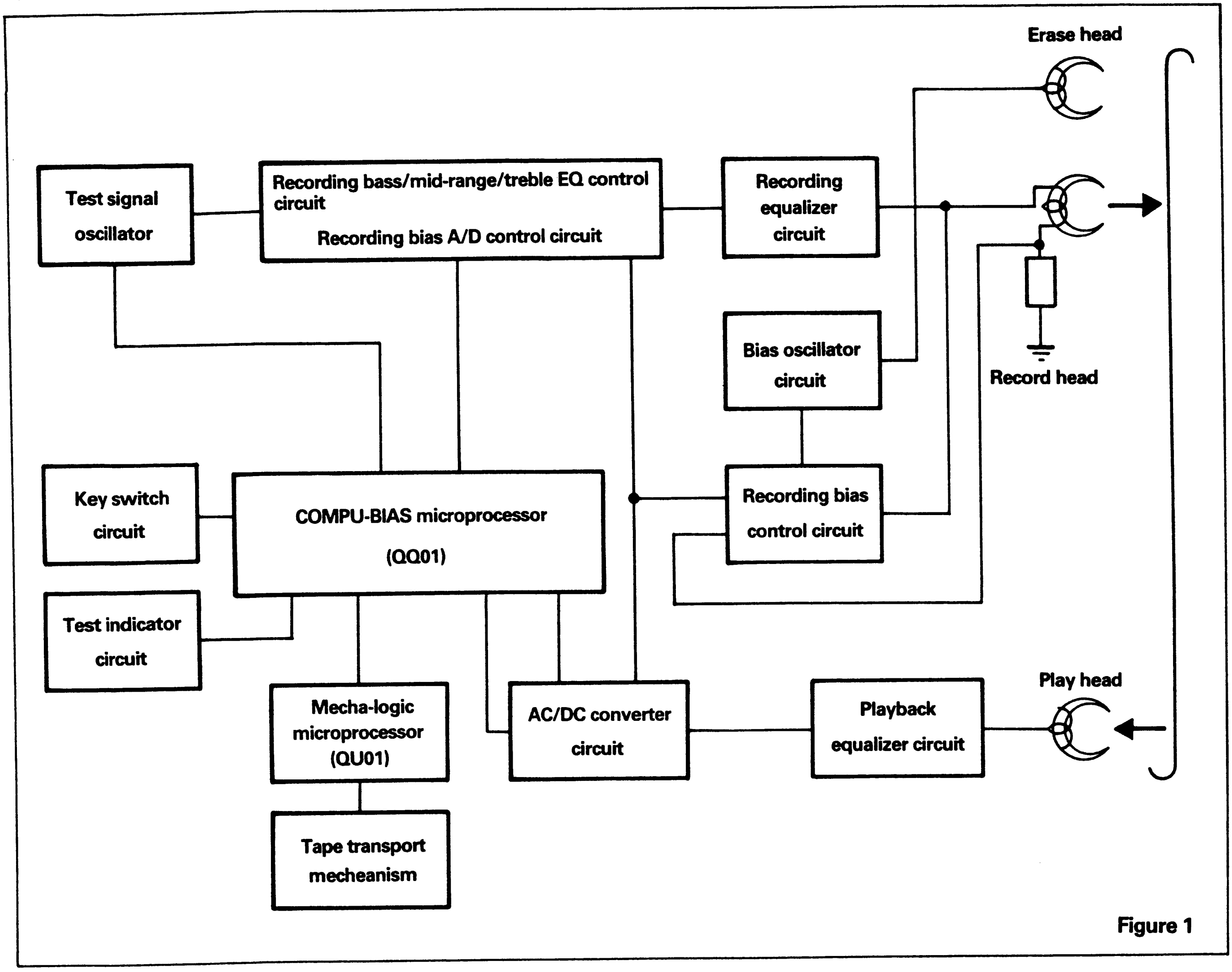

Erase head
Test signal oscillator
Recording bass/mid-range/treble EQ control circuit
Recording bias A/D control circuit
Recording equalizer circuit
Bias oscillator circuit
Record head
Key switch circuit
COMPU-BIAS microprocessor (QQ01)
Recording bias control circuit
Test indicator circuit
Play head
Mecha-logic microprocessor (QU01)
AC/DC converter circuit
Playback equalizer circuit
Tape transport mecheanism

Figure 1

Figure 1 is a schematic diagram of the COMPU-BIAS and Figure 5 a block diagram.
When test starts, the COMPU-BIAS microprocessor controls the "mecha-logic control" microprocessor (QU01) and puts it in record mode. It controls operation of the test signal oscillator and its output frequency and provides the recording bass/mid-range/treble equalizers (QK01 and 02) and the recording bias circuit with control data to perform recording and playback it detects the current playback level and works out optimum recording bias control data and optimum recording equalizer data. When test completes, the tape is rewound back to the location where test started and the "mecha-logic control" microprocessor is controlled to perform AUTO REC MUTE.

4.4 TEST ITEMS OF COMPU-BIAS

The test items are listed in Table 1. Figure 2 shows timing diagrams and Figure 4 a flowchart of the tests.

Table 1

		Test signal frequency
1.	Magnetic tape sensing test	1kHz
2.	Level coarseadjust	1kHz
3.	UP-direction recording bias test	1kHz
4.	DOWN-direction recording bias test	1kHz
5.	L-channel bass EQ test	1kHz
6.	L-channel mid-range EQ test	7kHz
7.	L-channel treble EQ test	15kHz
8.	L-channel bass EQ test	1kHz
9.	L-channel mid-range EQ test	7kHz
10.	L-channel treble EQ test	15kHz
11.	L-channel bass EQ test	1kHz
12.	L-channel mid-range EQ test	7kHz
13.	L-channel treble EQ test	15kHz
14.	R-channel bass EQ test	1kHz
15.	R-channel mid-range EQ test	7kHz
16.	R-channel treble EQ test	15kHz
17.	R-channel bass EQ test	1kHz
18.	R-channel mid-range EQ test	7kHz
19.	R-channel treble EQ test	15kHz
20.	R-channel bass EQ test	1kHz
21.	R-channel mid-range EQ test	7kHz
22.	R-channel treble EQ test	15kHz
23.	Magnetic tape sensing test	1kHz

M2365

AC-212
NORMAL TAPE
OUTPUT VOLTAG WAVEFORMS AT TPOI AND TPO2 DURING
COMPU-BIAS TEST

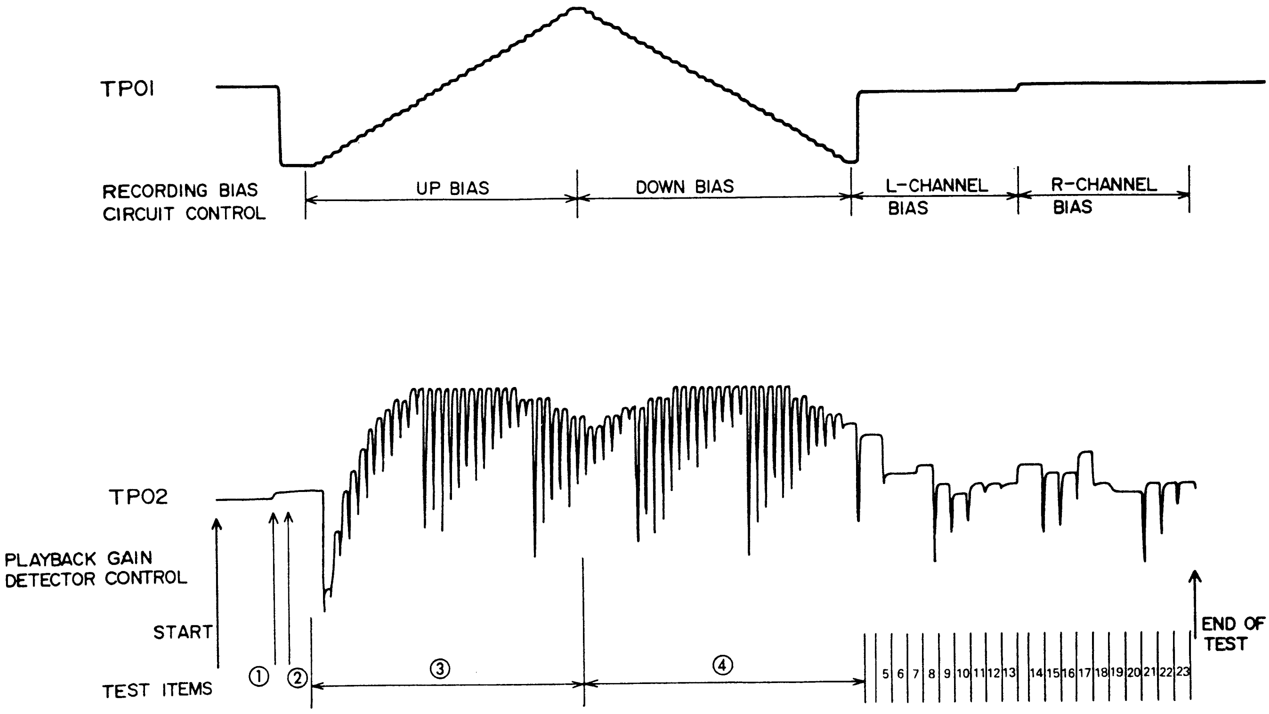


Figure 2

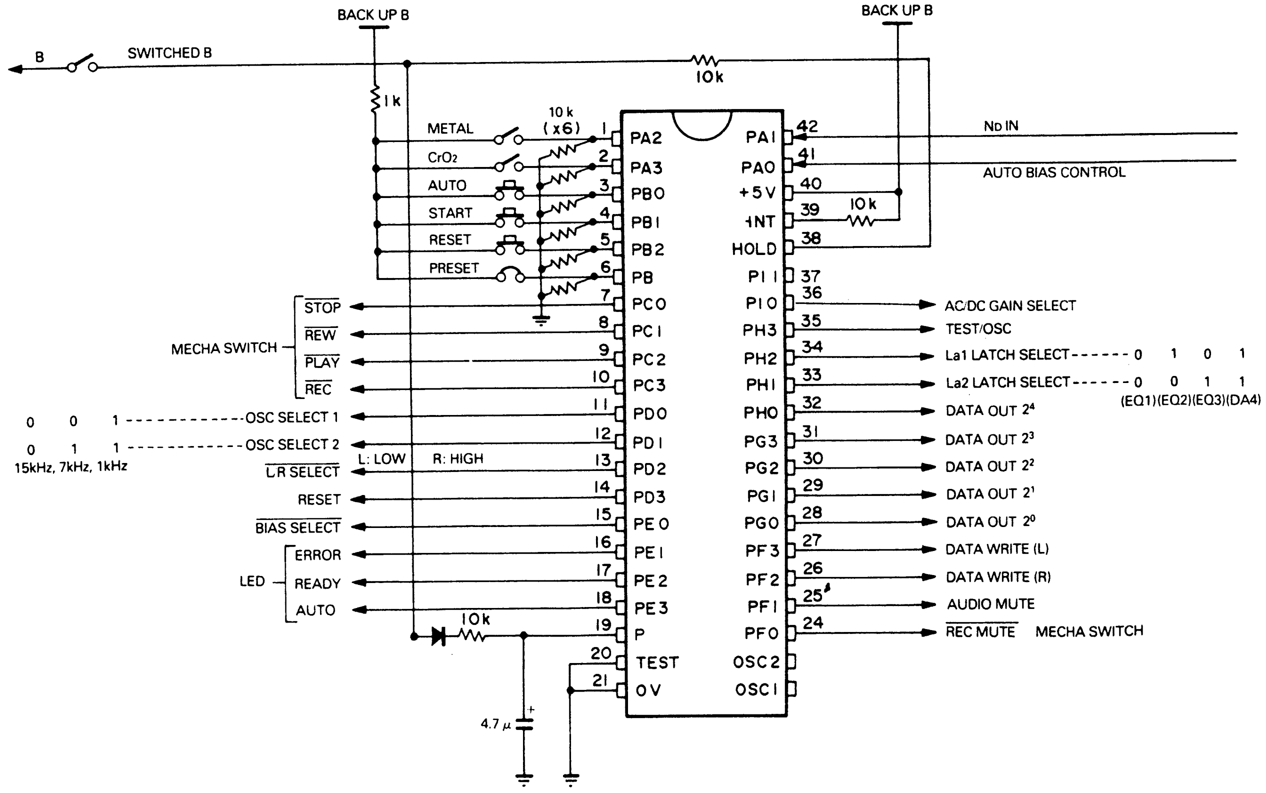

BACK UP B
BACK UP B
B
SWITCHED B
10k
1k
METAL
CrO2
AUTO
START
RESET
PRESET
10 k
(x6)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
PA2
PA3
PB0
PB1
PB2
PB
PC0
PC1
PC2
PC3
PD0
PD1
PD2
PD3
PE0
PE1
PE2
PE3
P
TEST
0V
PA1
PA0
+5V
INT
HOLD
PI1
PI0
PH3
PH2
PH1
PH0
PG3
PG2
PG1
PG0
PF3
PF2
PF1
PF0
OSC2
OSC1
42
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
10k
ND IN
AUTO BIAS CONTROL
MECHA SWITCH
STOP
REW
PLAY
REC
0 0 1 OSC SELECT 1
0 1 1 OSC SELECT 2
15kHz, 7kHz, 1kHz
L: LOW
R: HIGH
L/R SELECT
RESET
BIAS SELECT
LED
ERROR
READY
AUTO
10k
4.7 μ
AC/DC GAIN SELECT
TEST/OSC
La1 LATCH SELECT 0 1 0 1
La2 LATCH SELECT 0 0 1 1
(EQ1)(EQ2)(EQ3)(DA4)
DATA OUT 2^4
DATA OUT 2^3
DATA OUT 2^2
DATA OUT 2^1
DATA OUT 2^0
DATA WRITE (L)
DATA WRITE (R)
AUDIO MUTE
REC MUTE
MECHA SWITCH

Figure 3

M2366

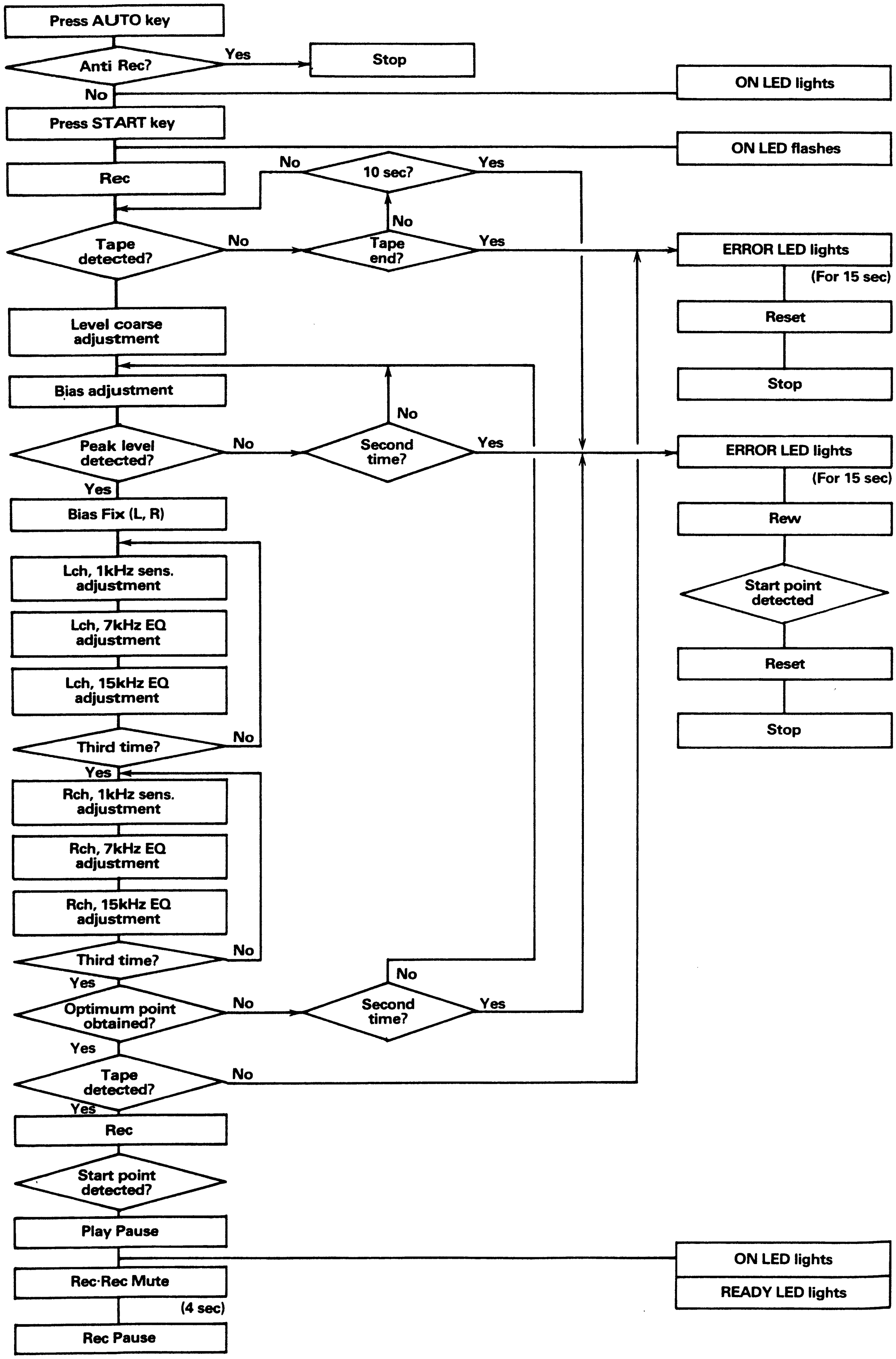

Press AUTO key
Anti Rec?
Yes
Stop
No
ON LED lights
Press START key
ON LED flashes
Rec
No
10 sec?
Yes
No
Tape detected?
No
Tape end?
Yes
ERROR LED lights
(For 15 sec)
Reset
Stop
Level coarse adjustment
Bias adjustment
No
Peak level detected?
No
Second time?
Yes
ERROR LED lights
(For 15 sec)
Yes
Bias Fix (L, R)
Rew
Lch, 1kHz sens. adjustment
Start point detected
Lch, 7kHz EQ adjustment
Reset
Lch, 15kHz EQ adjustment
Stop
Third time?
No
Yes
Rch, 1kHz sens. adjustment
Rch, 7kHz EQ adjustment
Rch, 15kHz EQ adjustment
Third time?
No
No
Yes
Optimum point obtained?
No
Second time?
Yes
Yes
Tape detected?
No
Yes
Rec
Start point detected?
Play Pause
ON LED lights
READY LED lights
Rec·Rec Mute
(4 sec)
Rec Pause

Figure 4

m2367

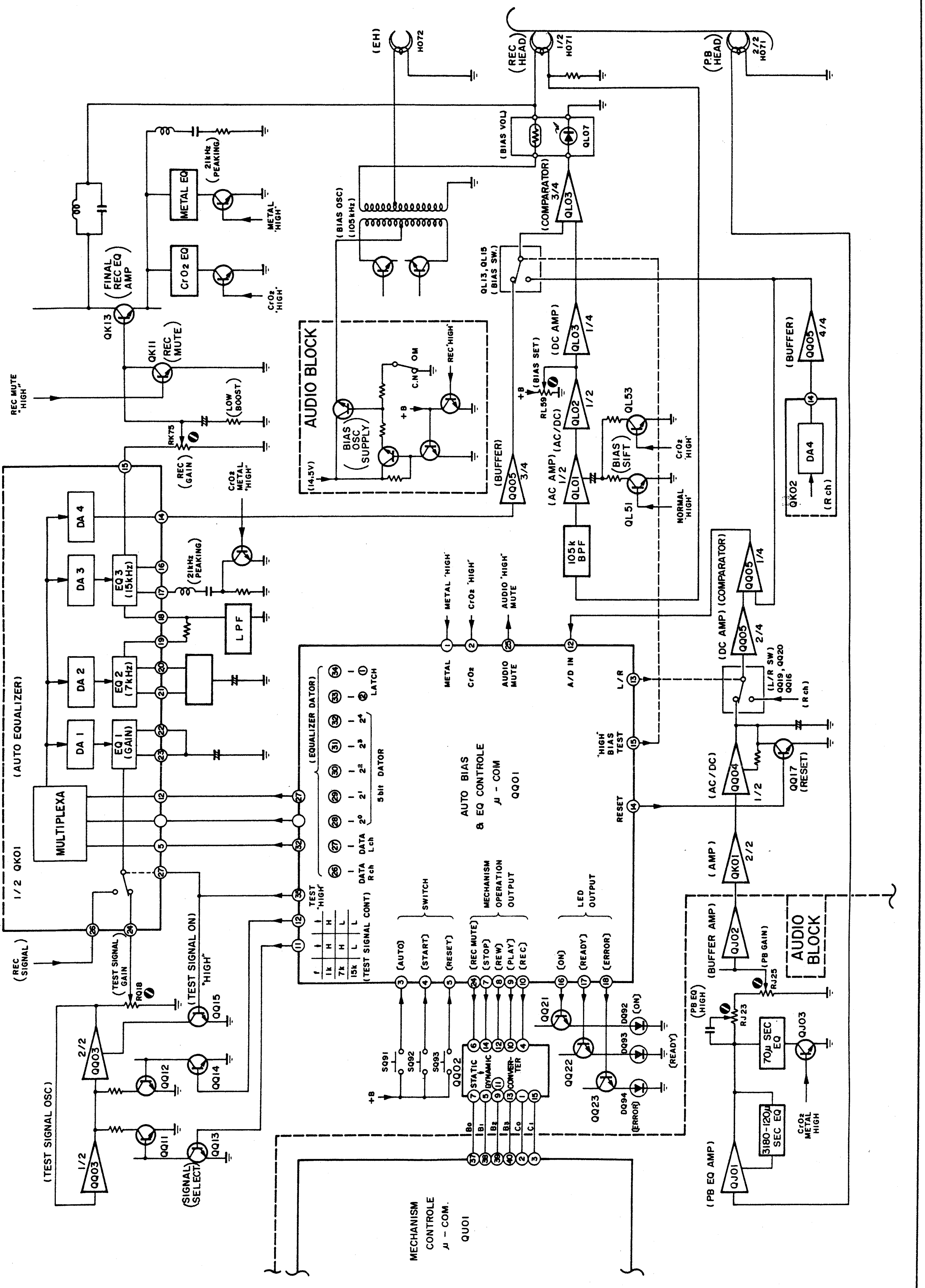

(EH)
H072
(REC HEAD)
1/2 H071
(P.B HEAD)
2/2 H071
(BIAS VOL)
QL07
(COMPARATOR) 3/4
QL03
(BIAS OSC) (105kHz)
QL13, QL15 (BIAS SW.)
(DC AMP)
QL03 1/4
(BUFFER)
QQ05 4/4
+B
(BIAS SET)
RL59
(AC/DC)
QL02 1/2
QL53
(BIAS SIFT)
CrO2 'HIGH'
(AC AMP) 1/2
QL01
QL51
NORMAL 'HIGH'
105k BPF
DA4
QK02
(R ch)
AUDIO BLOCK
BIAS OSC SUPPLY
(14.5V)
+B
C.N
OM
REC 'HIGH'
(BUFFER)
QQ05 3/4
(FINAL REC EQ AMP)
QK13
METAL EQ
21kHz (PEAKING)
METAL 'HIGH'
CrO2 EQ
CrO2 'HIGH'
QK11 (REC MUTE)
REC MUTE 'HIGH'
(LOW BOOST)
RK75
(REC GAIN)
CrO2 METAL 'HIGH'
21kHz (PEAKING)
LPF
(AUTO EQUALIZER)
1/2 QK01
DA 4
DA 3
EQ 3 (15kHz)
DA 2
EQ 2 (7kHz)
DA 1
EQ 1 (GAIN)
MULTIPLEXA
REC SIGNAL
(TEST SIGNAL GAIN)
RQ18
(TEST SIGNAL ON) 'HIGH'
QQ15
2/2 QQ03
QQ12
QQ14
(TEST SIGNAL OSC)
1/2 QQ03
QQ11
QQ13
(SIGNAL SELECT)
METAL 'HIGH'
CrO2 'HIGH'
AUDIO 'HIGH' MUTE
METAL
CrO2
AUDIO MUTE
A/D IN
L/R
'HIGH' BIAS TEST
RESET
(EQUALIZER DATOR)
LATCH
5 bit DATOR
DATA Rch
DATA Lch
TEST 'HIGH'
(TEST SIGNAL CONT)
AUTO BIAS & EQ CONTROLE μ - COM QQ01
SWITCH
MECHANISM OPERATION OUTPUT
LED OUTPUT
(AUTO)
(START)
(RESET)
(REC MUTE)
(STOP)
(REW)
(PLAY)
(REC)
(ON)
(READY)
(ERROR)
SQ91
SQ92
SQ93
+B
QQ02
STATIC
DYNAMIC
CONVER-TER
QQ21
QQ22
QQ23
D092 (ON)
D093 (READY)
D094 (ERROR)
B0
B1
B2
B3
C0
C1
MECHANISM CONTROLE μ - COM. QU01
(DC AMP) (COMPARATOR)
QQ05 1/4
QQ05 2/4
(L/R SW) QQ19, QQ20 QQ16
(R ch)
(AC/DC)
QQ04 1/2
QQ17 (RESET)
(AMP)
QK01 2/2
(BUFFER AMP)
QJ02
(PB GAIN)
RJ25
AUDIO BLOCK
(PB EQ HIGH)
RJ23
70μ SEC EQ
QJ03
CrO2 METAL HIGH
3180-120μ SEC EQ
(PB EQ AMP)
QJ01

Figure 5

m 2368

4.5. OPERATION OF THE COMPU-BIAS MICROPROCESSOR (QQ01)

Inputs and outputs of the COMPU-BIAS microprocessor (QQ01) are shown in figure 3. Operation of the COMPU-BIAS microprocessor is described below accoring to the flowchart.

4.5.1. Initial state

Figure 6 shows the initial states of the QQ01's terminals.

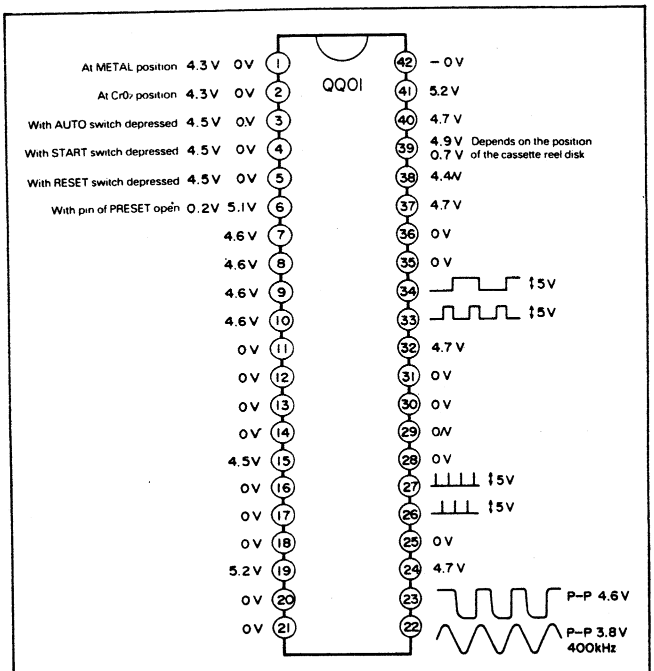

QQOI
At METAL position 4.3 V 0V ①
At CrO₂ position 4.3V 0V ②
With AUTO switch depressed 4.5V 0V ③
With START switch depressed 4.5V 0V ④
With RESET switch depressed 4.5V 0V ⑤
With pin of PRESET open 0.2V 5.1V ⑥
4.6V ⑦
4.6V ⑧
4.6V ⑨
4.6V ⑩
0V ⑪
0V ⑫
0V ⑬
0V ⑭
4.5V ⑮
0V ⑯
0V ⑰
0V ⑱
5.2V ⑲
0V ⑳
0V ㉑
㊷ −0V
㊶ 5.2V
㊵ 4.7V
㊴ 4.9V 0.7V Depends on the position of the cassette reel disk
㊳ 4.4V
㊲ 4.7V
㊱ 0V
㉟ 0V
㉞ ↕5V
㉝ ↕5V
㉜ 4.7V
㉛ 0V
㉚ 0V
㉙ 0V
㉘ 0V
㉗ ↕5V
㉖ ↕5V
㉕ 0V
㉔ 4.7V
㉓ P–P 4.6V
㉒ P–P 3.8V 400kHz

Figure 6

4.5.2. Operation after depression of the auto switch

a. Pin ⑥ of microprocessor QQ01
   FACTORY SET MEMORY DATA is, when pin PRESET is shorted, output and delivered to QK01 and QK02 (auto EQ ICs) and user SET MEMORY DATA when the pin is open.
b. When AUTO LED is lighting
   QQ01 pin ⑱ Low → High

4.5.3. Operation after depression of the START switch

1. Operation immediately after depression of the START switch

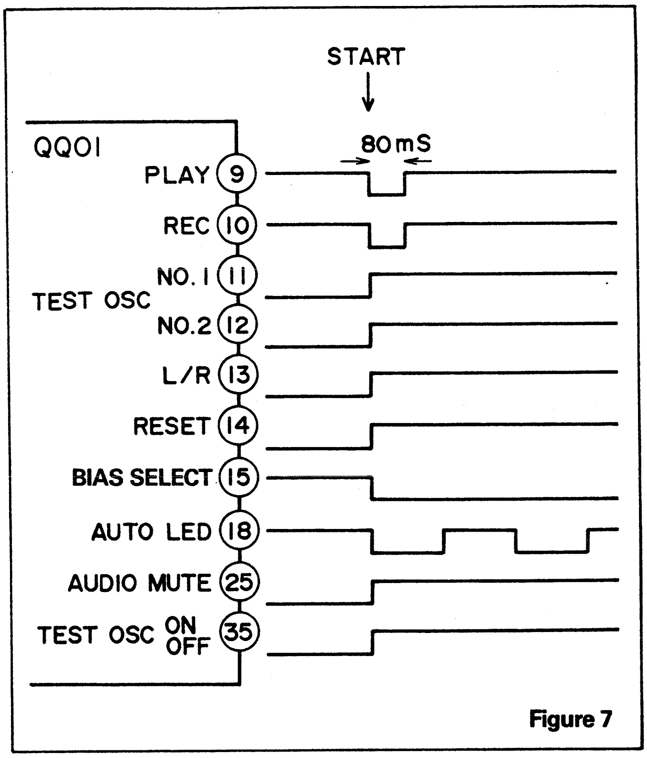

START
80mS
QQOI
PLAY ⑨
REC ⑩
TEST OSC
NO. 1 ⑪
NO.2 ⑫
L/R ⑬
RESET ⑭
BIAS SELECT ⑮
AUTO LED ⑱
AUDIO MUTE ㉕
TEST OSC ON OFF ㉟

Figure 7

a. High → Low output of microprocessor pins ⑨ and ⑩ gets subjected to QQ02 Statics → Matrix conversion and delivered to mechanism's microprocessor QU01 to put the device in REC mode.
b. The 5-bit data of pins ㉘ through ㉜ is fixed to "10000B". The control data of the bass/mid-range/treble recording equalizer and recording bias circuit are also fixed to a central value.
c. Pin ㉕ turns from Low to High to play-mute the audio system. The mechanism control keys are inhibited.
d. Pin ㉟ turns from Low to High to activate test signal oscillator QQ03 and set the signal selector of auto EQ ICs (QK01 and QK02) at the Test Signal side.
e. Pin ⑪ and ⑫ turn from Low to High to set the output frequency of QQ03 at 1kHz.
f. Pin ⑬ changes from Low (L channel) to High (R channel).
g. Pin ⑭ changes from Low to High to reset the device.
h. Pin ⑱ changes from High to Low to High repeatedly to let and LED blink.

2. MAG detection and level coarse adjustment
   The presence of magnetic tape is check about one second after START, then level coarse adjustment is performed.

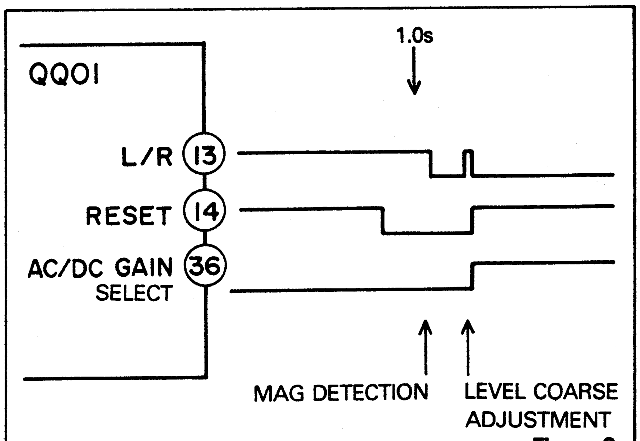

1.0s
QQOI
L/R ⑬
RESET ⑭
AC/DC GAIN SELECT ㊱
MAG DETECTION
LEVEL COARSE ADJUSTMENT

Figure 8

M2369

In the detection of the presence of magnetic tape, an error results and the mechanism stops if magnetic tape does not come in approximately 10 seconds. The presence of magnetic tape is checked on the R channel.
After 70 msec after the detection of magnetic tape, level is checked in both the L and R channels at 1kHz and the value of EQ1 of AUTO EQ (QK01 and QK02) is corrected to reach a reference level. The level is detected by comparing the DC voltage generated by QK02 digital-to-analog conversion with the result of AC-to-DC conversion of the playback demodulator.

3. Detection of peak bias
In approximately 0.4 second after level coarse adjustment, bias is raised gradually and, during this time, the peak playback level is memorized in QQ01 (1 step 80 msec). Level is checked at every step for both L and R to find a peak. When the bias has reached the upper limit, it then is lowered step by step to find a peak. And the average of the peak levels found during upward and downward searches is worked out. If no peak is found during a cycle of search, search will be made one more time. And an error result if no peak is found still.

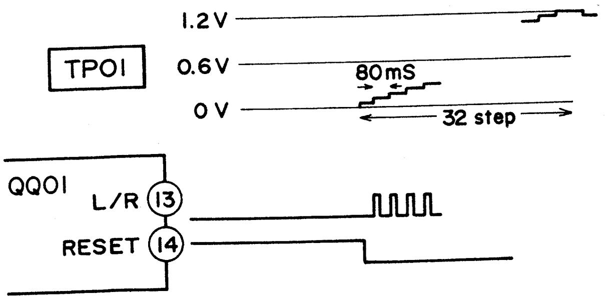

1.2V
TP01
0.6V
80mS
0V
32 step
QQ01
L/R ⑬
RESET ⑭

Figure 9

4. Equalizer adjustment
In approximately 6.5 seconds after START, peak bias detection ends and equalizer adjustment begins.

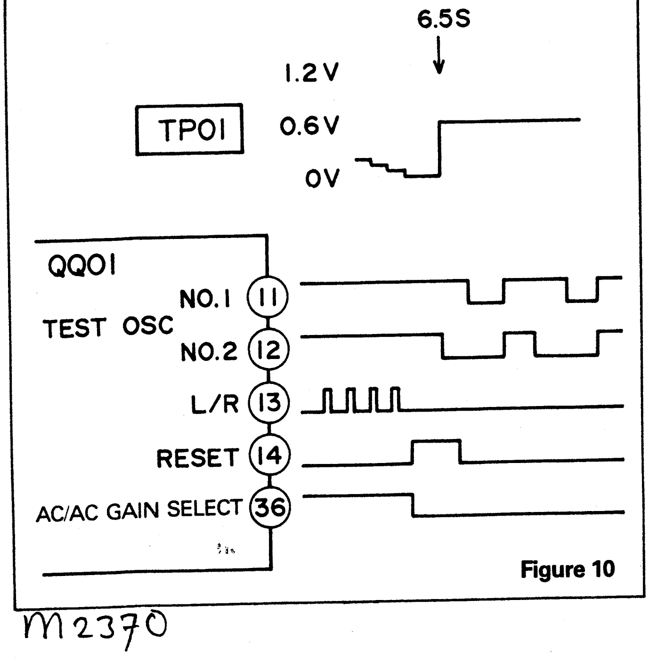

6.5S
1.2V
TP01
0.6V
0V
QQ01
NO.1 ⑪
TEST OSC
NO.2 ⑫
L/R ⑬
RESET ⑭
AC/AC GAIN SELECT ㊱

Figure 10

The peak biases detected on the L and R channels are output from QK01 DA4 to perform equalizer adjustment. The R-channel equalizer is adjustment first and then the L-channel one.
Outputs of QQ01 pins ⑪ and ⑫ are switched to generate signals of 1kHz, 7kHz and 15kHz. EQ1 is adjusted to attain a reference level by recording and playing back 1 kHz. EQ2 is adjusted similarly with 7kHz and EQ3 is adjusted with 15 kHz. This process is repeated three times until the frequency response becomes flat.
Figure 11 shows system adjustement. The process of adjustment is explained below.

(i) Microprocessor QQ01 outputs data of central values and, with the data, QK01 (02) performs:
Digital data → DC level → EQ amp gain setup
(ii) The signal recorded in the condition of (i) becomes a signal of DC level through the play head → playback equalizer amplifier → AC/DC amplifier.
(iii) The DC level above is compared with the reference voltage set for the microprocessor.
(iv) The result of comparison is judged and a new data which includes the difference is determined.
(v) Recording of the second time is made with the new data.
(vi) This process is repeated three times.

ADJUSTMENT OF THE RECORDING EQUALIZER OF THE COMPU-BIAS SYSTEM

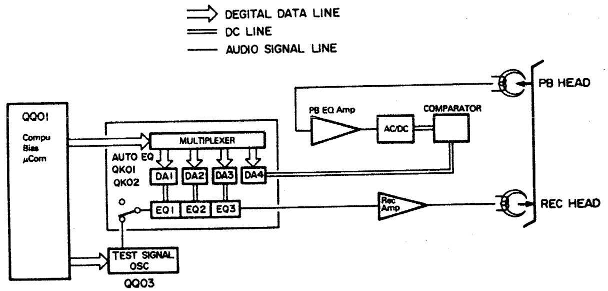
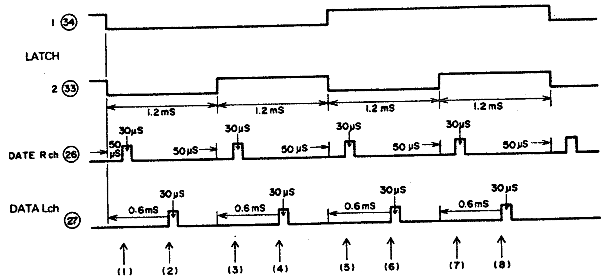

DEGITAL DATA LINE
DC LINE
AUDIO SIGNAL LINE
PB HEAD
PB EQ Amp
COMPARATOR
AC/DC
QQ01
Compu Bias μCom
MULTIPLEXER
AUTO EQ
QK01
QK02
DA1
DA2
DA3
DA4
EQ1
EQ2
EQ3
Rec Amp
REC HEAD
TEST SIGNAL OSC
QQ03

Figure 11

TIMING OF TRANSFER OF DATA FROM COMPU-BIAS MICROPROCESSOR QQ01 TO QK01/02


1 ㉞
LATCH
2 ㉝
1.2mS
1.2mS
1.2mS
1.2mS
30μS
30μS
30μS
30μS
50μS
DATE R ch ㉖
50μS
50μS
50μS
50μS
30μS
30μS
30μS
30μS
DATA L ch ㉗
0.6mS
0.6mS
0.6mS
0.6mS
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)

(1) DATA of 5 bits enters ㉘ - ㉜ of R-channel EQ1.
(2) DATA of 5 bits enters ㉘ - ㉜ of L-channel EQ1.
(3) DATA of 5 bits enters ㉘ - ㉜ of R-channel EQ2.
(4) DATA of 5 bits enters ㉘ - ㉜ of L-channel EQ2.
(5) DATA of 5 bits enters ㉘ - ㉜ of R-channel EQ3.
(6) DATA of 5 bits enters ㉘ - ㉜ of L-channel EQ3.
(7) DATA of 5 bits enters ㉘ - ㉜ of R-channel DA4.
(8) DATA of 5 bits enters ㉘ - ㉜ of L-channel DA4.

Figure 12

- DATA is entered at the rise of ㉖ and ㉗

Figure 12 shows the timing of DATA transfer from COMPU-BIAS microprocessor QQ01 to auto EQ ICs (QK01/02).

M2370

5. Process of end of MAG detection
   When the presence of magnetic tape is confirmed (by detecting level), tests end, the tape is rewound to the START point, "READY" LED lights, and after AUTO REC MUTE 4SEC, REC PAUSE is entered.

4.5.4 Operation after depression of the RESET switch

1. Depression of the RESET switch after the AUTO switch
   - "AUTO" LED goes on → goes off
   - User memory data out

     ↓

     FACTORY memory data out
     (If the pin of PRESET is shorted, only FACTORY data is out regardless of the RESET switch.)
   - Suppose that the "AUTO" LED is on and the mechanism is operating normally. If you depress the RESET switch at this time, the mechanism stops.
2. "RESET" during COMPU-BIAS TEST
   - The "AUTO" LED goes out.
   - FACTORY memory data out
   - After the tape is rewound to the start point, the deck enters STOP mode.

NOTE: If you operates the TAPE SELECTOR during TEST, the deck will be "reset".

4.6. PROGRESS OF TEST AND INDICATOR

Table 2

TEST ITEM	"AUTO" LED	"READY" LED
AUTO SW. ON	LIT	LIT
"START" SW ON MAG DETECTION LEVEL COARSE ADJUSTMENT PEAK BIAS DETECTION	STARTS TO BLINK ON TIME 160ms OFF TIME 160ms	OFF
EQUALIZER ADJUSTMENT	BLINKS ON TIME 160ms OFF TIME 320ms	OFF
END OF TEST REW STOP	BLINKS ON TIME 160ms OFF TIME 160ms	OFF
AUTO REC MUTE	LIT	LIT

4.7. OPERATION OF CIRCUITS

4.7.1 Test signal generator

Figure 13

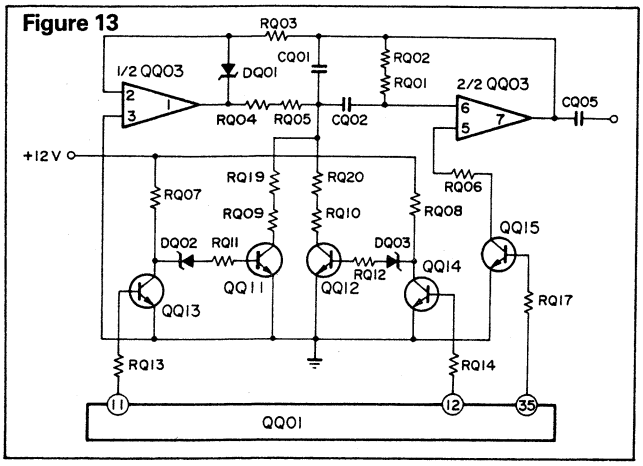
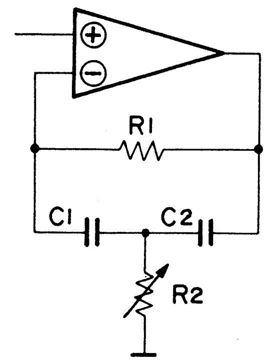

RQ03
CQ01
RQ02
1/2 QQ03
DQ01
RQ01
2/2 QQ03
2
3
1
RQ04
RQ05
CQ02
6
5
7
CQ05
+12V
RQ19
RQ20
RQ06
RQ07
RQ09
RQ10
RQ08
QQ15
DQ02
RQ11
DQ03
RQ12
QQ14
QQ11
QQ12
QQ13
RQ17
RQ13
RQ14
11
12
35
QQ01

Table 3

QQ01 PIN NO.	NO. OSCILLATION	1 kHz	7 kHz	15 kHz
35	0	1	1	1
11	—	1	1	0
12	—	1	0	0

An audio signal used to test COMPU-BIAS is generated in the test signal generator shown in Figure 13.
Table 3 shows the microprocessor's output data which are used to control the oscillator and select frequency.
[Operating principle]
It is an oscillator using a bridged T-filter.
In this model, R2 is changed with an electronic switch to obtain a required frequency.



$$f_0 = \frac{1}{2\pi C_1 R_m}$$

$$C_1 = C_2$$

$$R_m = \sqrt{R_1 \cdot R_2}$$

Figure 14

4.7.2 Recording equalizer control circuit

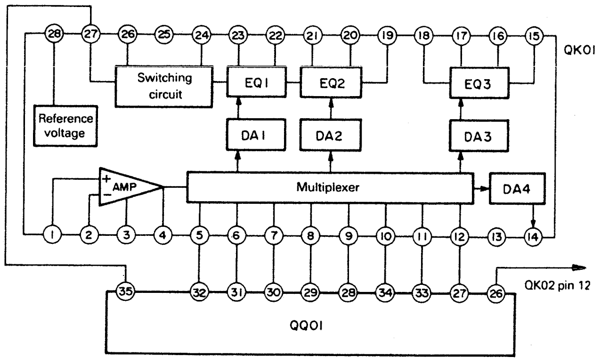

28
27
26
25
24
23
22
21
20
19
18
17
16
15
QK01
Switching circuit
EQ1
EQ2
EQ3
Reference voltage
DA1
DA2
DA3
AMP
Multiplexer
DA4
1
2
3
4
5
6
7
8
9
10
11
12
13
14
QK02 pin 12
35
32
31
30
29
28
34
33
27
26
QQ01

Figure 15

Figure 15 shows a block diagram of IC QK01. This IC incorporates bass/mid-range/treble EQ, latch, D/A converter working to control recording bias and detect playback gain, and playback power amplifier.
As input signals, an external audio signal of line or microphone is supplied to QK01 pin ㉖ and the output signal of the test signal generator to QK01 pin ㉔.
These input signals are, switched by the digital signal supplied from QQ01 to QK01 pin ㉗, delivered to an EQ amplifier that follows. The test signal is selected when level is H, and the external audio signal is selected when level is L.
EQ1, EQ2, and EQ3 are variable-gain amplifiers whose bands are determined with the Coils, Capacitors, and Resistors connected to pins ⑯, ⑰,⑳ ,㉑,㉒, and ㉓, with gains controlled by 5-bit data coming to pins ⑤ through ⑨ .

M2371

The 5-bit data of pins ⑤ through ⑨ is subjected to D/A conversion to control gain. D/A converter DA4 operates for a control signal of an external recording bias circuit and playback gain detecting circuit.
During test of COMPU-BIAS, the recording bias circuit is controlled with "DA4" of QK01 and the playback gain detecting circuit by "DA4" of QK02.
Data are given to the eight D/A converters of the L and R channels by time division to reduce the number of IN/OUT terminals. The data are held in latches when they are not changed. The latch to which 5-bit data is sent is determined by 2-bit equalize select signal (pins ⑩ and ⑪ of QK01) and 1-bit channel select signal (pin ⑫ of QK01) which selects either of QK01 or QK02 to write data.
Table 4 shows input data of QK01 and Table 5 selection of DA.

Table 4

QK01 PIN NO.	SIGNAL
9	2^0 WEIGHT (LSB)
8	2^1 WEIGHT
7	2^2 WEIGHT
6	2^3 WEIGHT
5	2^4 WEIGHT (MSB)

Table 5

QK01 PIN NO.	10	11	SELECTION
STATE	0	0	DA1, EQ1
	0	1	DA2, EQ2
	1	0	DA3, EQ3
	1	1	DA4

4.7.3 Recording bias control circuit/erase circuit

1. Erase circuit
   The bias oscillator which comprises QL11 and QL12 drives the erase head. The supply voltage of the oscillator is raised for metal tape to produce better demagnetizing effect. Pin ㉗ of mecha-logic microprocessor becomes High by REC command. This signal goes via QU19, QU25, QU23, and QU22 to QU21 to turn it on and cause the bias oscillator to oscillate. SU01-3 which is the METAL position switch of the tape selector changes the base voltage of QU21 to raise the supply voltage of the oscillator at METAL position.
2. Recording bias circuit
   During the test of COMPU-BIAS, "DA4" of QK01 controls the recording biases of both channels. During normal recording, "DA4" of QK01 controls the recording bias of the L channel and "DA4" of QK02 that of the R channel, switched by transistor switches QL15, QL16, QL13, and QL14 from pin ⑮ of COMPU-BIAS microprocessor QQ01. A bias control voltage output from QK01 pin ⑭ comes in to the plus input of comparator QL03 via buffer QQ05.
   On the other hand, the voltage developing across RL15 as the recording bias current flows is passed through an audio-band filter, amplified by QL01, and rectified by QL02. After amplifier and corrected by (1/4) QL03, the DC voltage comes to the minus input of QL03 (3/4).
   If the plus input is higher than the minus input, the output of QL03 is plus, the internal resistance of photocoupler QL07 decreases, more bias current flows, and the output voltage of QL03 (1/4) rises, so that the plus input becomes as high as the minus input. Thus the bias control voltage developing at QK01 pin ⑭ controls the bias.

m2372

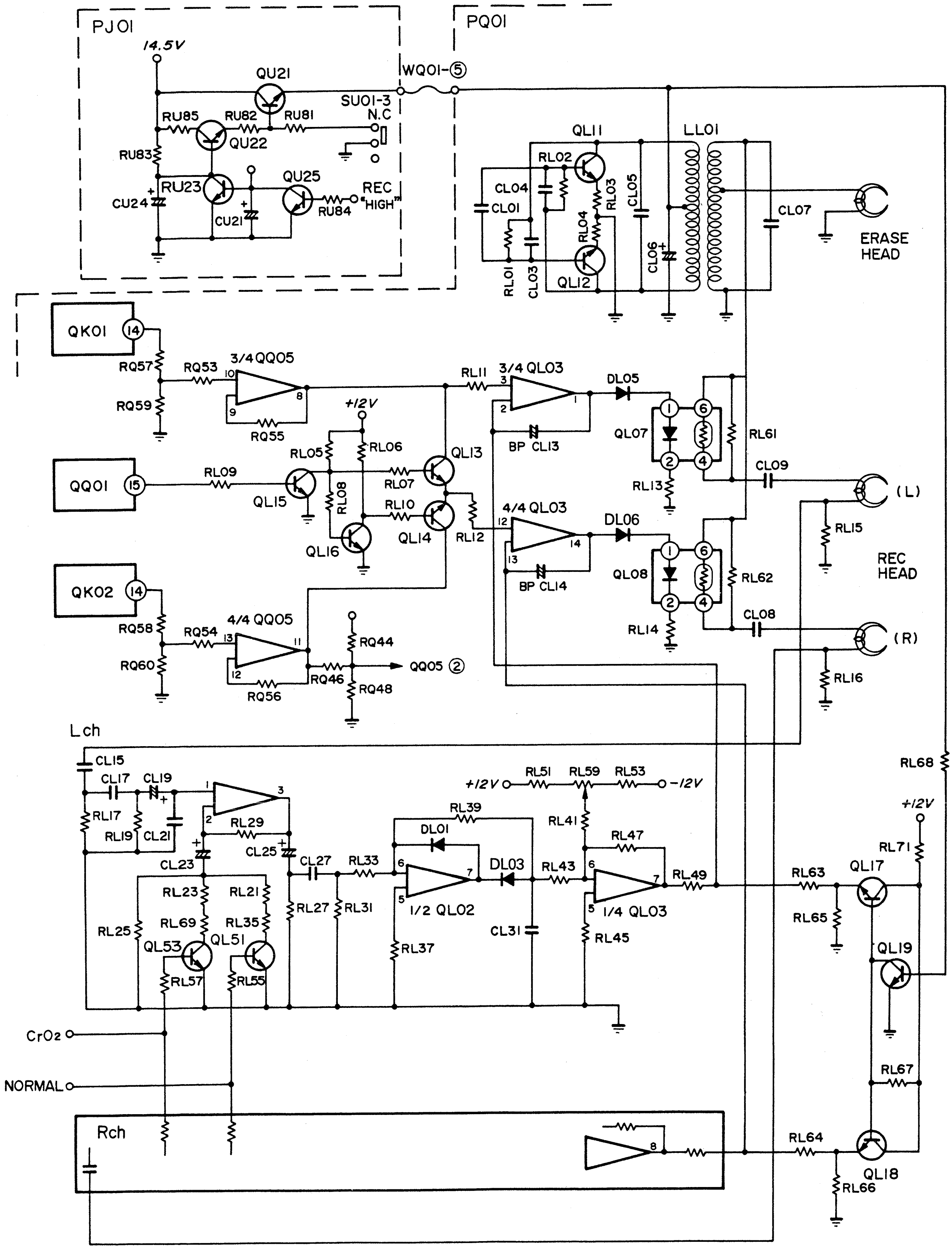

PJ01
14.5V
QU21
WQ01-⑤
PQ01
RU85
RU82
RU81
SU01-3
N.C
QU22
RU83
RU23
QU25
REC
"HIGH"
CU24
CU21
RU84
QL11
LL01
RL02
CL04
CL01
RL03
CL05
CL07
ERASE
HEAD
RL04
CL06
RL01
CL03
QL12
QK01
14
RQ57
RQ53
3/4 QQ05
10
8
9
RL11
3/4 QL03
3
1
2
DL05
RQ59
RQ55
+12V
RL05
RL06
QL07
BP CL13
RL61
QL13
1
6
2
4
QQ01
15
RL09
RL07
RL13
CL09
(L)
QL15
RL08
RL10
4/4 QL03
12
14
13
DL06
RL15
QL16
QL14
RL12
REC
HEAD
QL08
RL62
BP CL14
QK02
14
4/4 QQ05
RQ58
RQ54
13
11
RQ44
RL14
CL08
(R)
RQ60
12
RQ46
QQ05 ②
RQ56
RQ48
RL16
Lch
CL15
CL17
CL19
RL68
RL51
RL59
RL53
+12V
-12V
RL17
RL19
CL21
RL29
RL39
+12V
RL41
RL71
CL23
CL25
CL27
RL33
DL01
DL03
RL47
RL43
RL49
RL63
QL17
RL23
RL21
6
7
1/2 QL02
5
6
7
1/4 QL03
5
RL25
RL69
RL35
RL27
RL31
RL65
QL53
QL51
CL31
RL45
RL37
QL19
RL57
RL55
CrO2
NORMAL
RL67
Rch
8
RL64
QL18
RL66

Figure 16

M2373

4.7.4 Playback gain detecting circuit

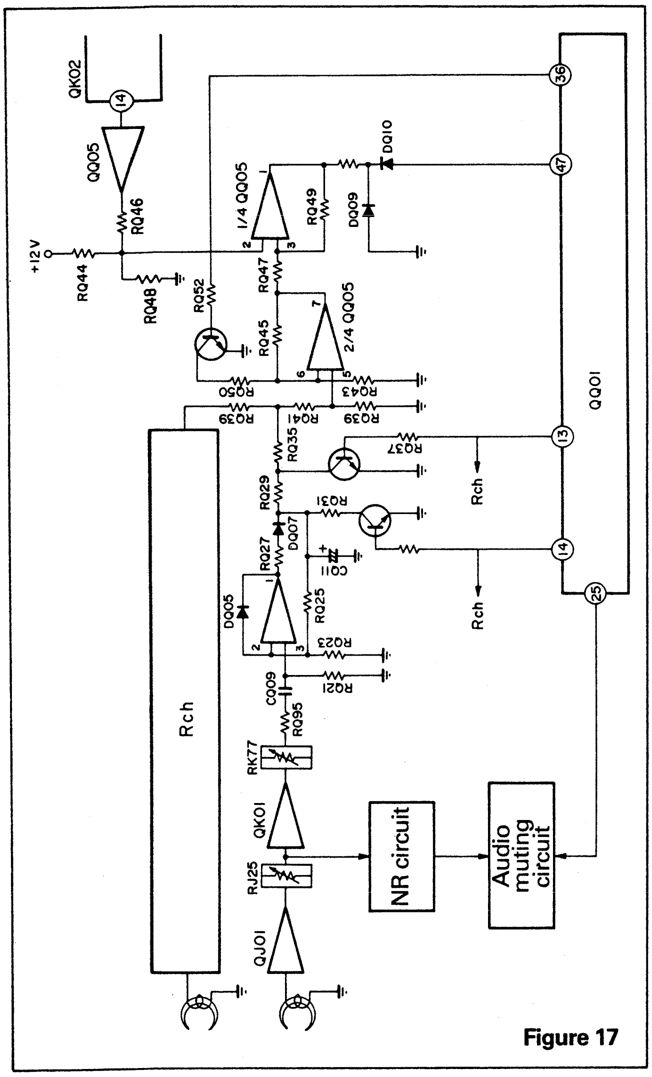

QK02
⑭
QQ05
RQ46
+12V
RQ44
RQ48
RQ52
1/4 QQ05
RQ47
RQ45
2/4 QQ05
RQ49
DQ09
DQ10
RQ50
RQ43
RQ39
RQ41
RQ39
RQ35
RQ37
RQ29
RQ31
RQ27
DQ07
CQ11
DQ05
RQ25
RQ23
RQ21
CQ09
RQ95
RK77
QK01
RJ25
QJ01
Rch
Rch
Rch
NR circuit
Audio muting circuit
QQ01
㉟
㊼
⑬
⑭
㉕

Figure 17

The playback gain detecting circuit detects the playback output of the test signal recorded with control data given to the recording equalizer and the recording bias control circuit, and converts analog signal to digital signal. Figure 17 shows the playback gain detecting circuit. It comprises amplifiers, sample & hold, L/R input selector, and comparator (A/D converter). COMPU-BIAS microprocessor QQ01 controls the circuit as follows.

1. L/R channel input selection
   Inputs to a comparator are switched to detect the playback output of the L and R channels. An L/R select signal is output from pin ⑬ of COMPU-BIAS microprocessor QQ01. "High" level selects the R channel and Low Level the L channel.
2. Resetting sample & hold
   CQ11 samples and holds the demodulated signal which is converted to DC. Before performing tests, turn on QQ17 to discharge the electricity held in CQ11. The sample & hold gets reset when QQ01 pin ⑭ turns to "High" level.
3. D/A control
   The data sampled and held comes to the plus input of a comparator (1/4 QQ05). On the other hand, the DC voltage which is converted from the 5-bit signal output from QK02 pin ⑭ enters in the minus input via a buffer (3/4 QQ05).
   From pins ㉘ ~ ㉜ of COMPU-BIAS microprocessor QQ01, 5-bit data starts from "00000B" and rises step by step until the voltage becomes equal to the plus input. At this time, the output of the comparator (1/4 QQ05) changes from "High" level to "Low" level and enters QQ01 pin ㊷ so that the playback level may be detected.
4. Changing gain during detection of peak bias
   The reference level is adjusted to the central value ("10000B") of 5 bits. In detection of peak bias, it is enough to detect a peak. During this time, therefore, gain is raised by 50% after the playback signal is converted to DC. As High level is output from QQ01 pin ㊱, QQ28 turns on and the gain of (2/4 QQ05) is raised for the above purpose. This improves capability of detecting level by 50%.
5. Muting monitor signal
   During test, "High" level is output from QQ01 pin ㉕ and applied to the audio muting circuit of the audio board (PJ01) to mute the monitor and LED METER signals.

4.7.5 Backup mode circuit

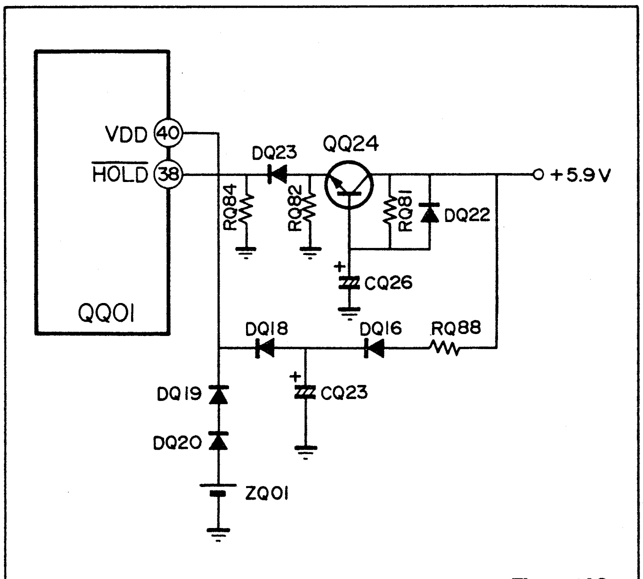

VDD ㊵
HOLD ㊳
QQ01
DQ23
QQ24
+5.9V
RQ84
RQ82
RQ81
DQ22
CQ26
DQ18
DQ16
RQ88
DQ19
CQ23
DQ20
ZQ01

Figure 18

When the power switch is off or during interruption of source power, the memory (RAM) of the COMPU-BIAS microprocessor (QQ01) is backed up by an external battery (lithium battery) while the other circuits are inactive. At this time, power consumption is so low that the data held in the RAM are preserved even if the supply voltage (VDD) falls to 2.0V. This is called backup mode.

When power is off, the signal shown below becomes necessary and the circuit shown in Figure 19 generates this signal. Set the HOLD jack to low level.

When the unit enters the HOLD mode, increase the power supply voltage. To release the HOLD mode, return the power supply voltage to normal value and adjust the HOLD jack to high level.

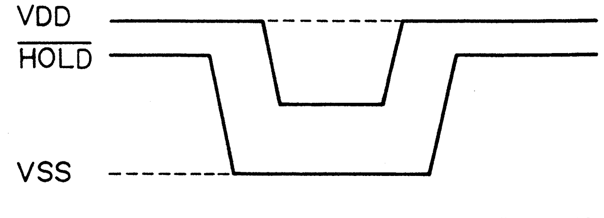

VDD
HOLD
VSS

Figure 19

m2374

4.8 MEMORY AND DATA

Data memory of the COMPU-BIAS microprocessor (QQ01) is available in two types; FACTORY SET MEMORY which is set by AUTO operation, using a standard tape, before shipment from the plant, and USER SET MEMORY which the user sets by AUTO operation, using his own tape.

- Selecting auto data input memory
  Short, or open, two PRESET pins on the COMPU-BIAS board (PQ01) to put the data set by AUTO operation into FACTORY SET MEMORY, or USER SET MEMORY.
- Recalling data
  Data may be recalled from the USER SET MEMORY when the AUTO switch has been depressed and the AUTO LED lights. The data is transferred to the auto equalizer (QK01/02).
  At this time, the two PRESET pins of the COMPU-BIAS board (PQ01) must be open. If they are shorted, data of the FACTORY SET MEMORY will be recalled.
- Preserving data in memory
  The data written in the memory will be preserved, backed up by battery.

5. DESCRIPTIONS OF MECHANISM AND CIRCUIT OPERATIONS

5.1 INITIAL CHECK

The following are items to be checked when the mechanism does not work even if the operation button of the set is pressed.

1. Mount the cassette tape and close the cassette door. The "REW" LED indicator should appear on and the supply reel should rotate clockwise slightly until the tape gets straightened.
2. If the above operation does not occur, it indicates that the mechanism control circuit does not work. In such a case check the following:
   - 2-1. Check whether or not pin ㊱ of QU01 is 0 V. If it is not 0 V, check if the EJECT switch (SO73) and the cassette switch (SO71) have been set to ON. Also check if QU11 is on.
   - 2-2. Check whether or not clock pulses are generated. Pluse signals haveing a frequcny of approximately 400 kHz should appear at pins ① and ㊷.
   - 2-3. Check whether or not a voltage of +5 V appears at pin ㊶.

NOTE: This set is designed so that it will not operate even if the operation button is pressed unless a tape is mounted on the cassette holder and the cassette door is closed.

5.2 IC OPERATION CIRCUIT

The mechanism is driven by IC outputs. The circuit that generates the IC outputs consists of push switches (SY01 to SY08).

Pulses shown in Figure 24 are generated at pins ② and ③ QU01 and applied to the push switches.

When no cassette tape is mounted or when SO71, SO73 and QU11 are off, that is, when pin ㊱ is 5 V, the outputs at pins ② and ③ remain level at 5 V.

Pressing a push switch will cause the output of pin ② or ③ to be applied to one of pins ㊲ to ㊵ that corresponds to the push switch and cause the outputs of QU01 to change.

NOTES:

1. **Appplying the voltage level 5 V to pins ㊲ to ㊵ will not change the outputs of QU01.**
2. **The width of the pulses output at pins ② and ③ varies.**

5.3 FF/REW OPERATIONS

The power of the reel motor (M072) is supplied by Q806. Since Q807 is normally off, the output voltage of Q806 is 4.6V, a voltage set by D808.

At the STOP condition, the outputs of pins ㉔ and ㉕ are both 5V. Therefore, QU12 and QU13 are off and no voltage is applied to M072.

When the FF button is pressed, the output at pin ㉕ becomes O V and a current flows through QU12, MO72 and then QU15.

Since during the REW operation the output at pin ㉔ is O V, a current flows through QU13, MO72 and then QU14.

5.4 PLAY OPERATION

When the PLAY button is pressed, pin ⑫ turns off and QU10. L071 (play plunger) turns on, causing the head chassis to rise and the pinch roller to press the capstan. At that time, the output at pin ㉓ turns on for 0.2 seconds. As a

m 2375

result, Q809 and D810 turn off and a voltage of approximately 17 V is applied to L071. Then, the output at pin ㉓ turns off, causing D810 and Q809 to turn on and the voltage applied to L071 to decrease to 9.5 V. At this time the plunger is held at its position. The mechanism is characterized in that during the PLAY operation the take-up reel is driven by the reel motor.

For this reason, during the PLAY operation the output at pin ㉔ is 0 V as in the case of the FF operation, causing the reel motor to rotate in the same direction as the FF operation. At the same time pin ㉒ is also off whereas Q807 is on. Accordingly, the output of Q806 which is the voltage applied to the reel motor is equal to the voltage divided by resistors R813 and R811. The value of this voltage is approximately 3.5 V. In addition, pin ㉙ becomes 0 V, cancelling the muting state of the line amplifier.

5.5 STOP OPERATION

When the STOP button is pressed while the mechanism is operating, pin ⑬ turns off for 0.4 seconds and QU09. L072 (break plunger) turns on. In addition, the pulses output by Q071, a photo-coupler, which keeps track of the rotation of the take-up reel are applied to pin ㉝. The winding of the tape is ended and the reel stops rotating. The output of Q071 remains level at 5 V or 0.5 V and as no more pulses enter pin ㉝, the mechanism is shut off automatically.

5.6 REC OPERATION

Pressing the REC button only will not activate the mechanism. Therefore, the PLAY or PAUSE button should be pressed at the same time. Also, before pressing the REC button, turn on S072, a switch used to prevent erroneous erasure. In addition, the signal at pin ㉝ must be 0 V during the REC operation.

The output at pin ㉘ becomes 0 V, cancelling the muting state of REC AMP only when the REC and PLAY buttons are pressed simultaneously. The signal at pin ㉗ becomes 5 V, putting the circuit in the recording state.

5.7 PAUSE OPERATION

Pressing the PAUSE button only will not activate the mechanism. If it is pressed while the mechanism is executing the PLAY operation or while the PAUSE button is being pressed, the mechanism enters a state similar to STOP. At this time the signals at pins ㉘ and ㉙ becomes 5 V, putting the line amplifier in the muting state.

5.8 SKIP CIRCUIT

- Operation of the inter-music gap detecting circuit

a. Basic operation

RJ15 (L channel) and RJ16 (R channel) compose the outputs of the playback equalizers of both channels and the resulting signal is applied to QJ72 which is a buffer provided to adapt to the low input impedance of QJ73. QJ73 and QJ74 have a gain of approximately 54 dB at 1 kHz. They also limit bandwidth to improve S/N of the detecting system. The amplified signal is then differentiated by CJ75 and RJ80 and the output which develops at the collector of QJ75 is applied to u-com QU01 pin ㉞. When the input exceeds +5V, u-com QU01 detects High and regards that the deck is playing back a music.

b. Band shift

Tape speed varied by 20-25 times as it is played back at the normal speed and at the high speed, and the frequency range of reproduced signals varies similarly. Low-frequency components are cut during fast playback. During normal playback, CJ72 is shorted by QJ76 and CJ76 works to limit bandwidth at low frequencies. During fast playback, u-com QU01 turns on QJ77 and off QJ76, and CJ72 works to limit bandwidth. The resulting characteristic is of a 6dB/oct. band-pass filter of 1.7 kHz during normal playback and 5.5 kHz during fast playback as shown in Figure 21. Detection time must also be varying during normal and fast playback times. u-com QU01 is programmed with the inter-music detection time of approximately 3 sec during normal playback and approximately 100 msec during fast playback. (With the operation time of the mechanism taken into consideration, the nominal detection time is 4 sec.)

c. Gain shift

The inter-music gap detecting circuit performs not only band shift but gain shift. This is to raise gain according to normal-fast frequency shift and for encoding in noise reduction. The result is as follows for normal speed and NR-OFF.

Table 6

	NR-off	Dolby-C	dbX
NORMAL SPEED (1.5kHz)	0	−13.5dB	−17.5dB
HIGH SPEED (5.5kHz)	−7dB	−14.5dB	−17.5dB

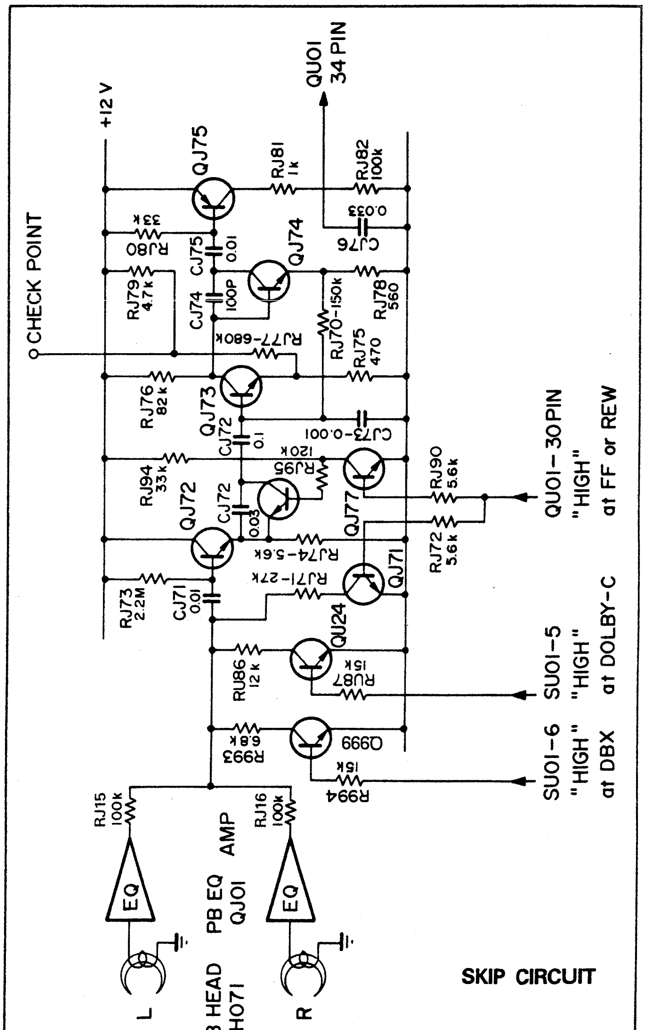


Figure 20

M2376

Switching is performed as follows.

- During high speed, RJ71 works with QJ71 on.
- Dolby-C: RJ86 works with QU24 on.
- dbX: R993 works with Q999 on.

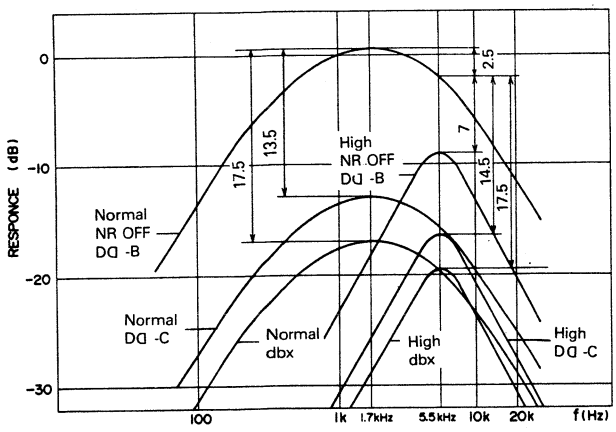


Figure 21

5.9 MUTING

Figure 23 is a block diagram of the muting circuit. Its operation is explained below.

1. Basic operation
   There are three kinds of muting as follows.
   a. Play Mute — muting of the motor drive system
   b. Rec Mute — muting signals to be recorded on tape
   c. Rec signal Mute — muting MIC or Line signals except during recording
   In all cases, the combination of PNP and NPN transistors as shown below is used to mute signals.

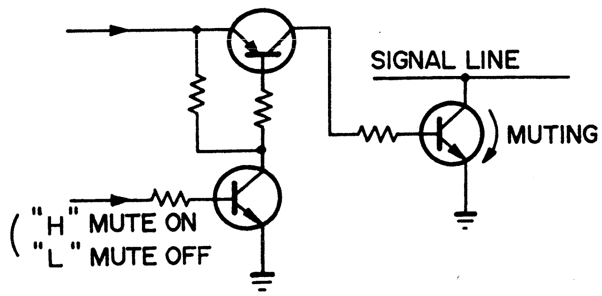


Figure 22

2. Play Mute
   As shown in Figure 23, QJ11 (12) and QJ09 (10) perform muting for all of the monitor system including the line amplifier, meter amplifier, and headphone amplifier. The coverage of muting is as follows.
   1) Direction of QU01 mechanism control microprocessor
      Muting except during PLAY, REC, and REC-PAUSE
      Operating time of the mechanism is taken into consideration and muting is released with a delay of 400 msec.
   2) Direction of QQ01 auto bias control microprocessor
      During auto operation, muting is released completely.
   3) Power on/off
      Immediately after power on and after power off, those which the QU01 mechanism control microprocessor cannot cover are covered.
3. REC MUTE
   As shown in Figure 23, QK11 (12) mutes the REC amplifier.
   4) Direction of QU01 mechanism control microprocessor
      Except during REC, muting is released with a delay time of approximately 600 msec. When directed by the REC MUTE key, muting is released without delay.
   5) Direction of QQ01 Auto Bias control microprocessor
      Direction of Rec Mute is included in the Auto Bias program and, in this case, operation proceeds through the matrix key-SW loop and QU01.
4. Rec signal Mute
   This is muting of MIC of LINE input signal as shown in Figure 23.
   6) Direction of QU01 mechanism control microprocessor
      Rec "High" signal of the microprocessor is inverted to REC "High" by QE24 to perform muting.
   7) Direction of QQ01 Auto Bias control microprocessor
      Muting during the run of the Auto Bias program is performed.

M2377

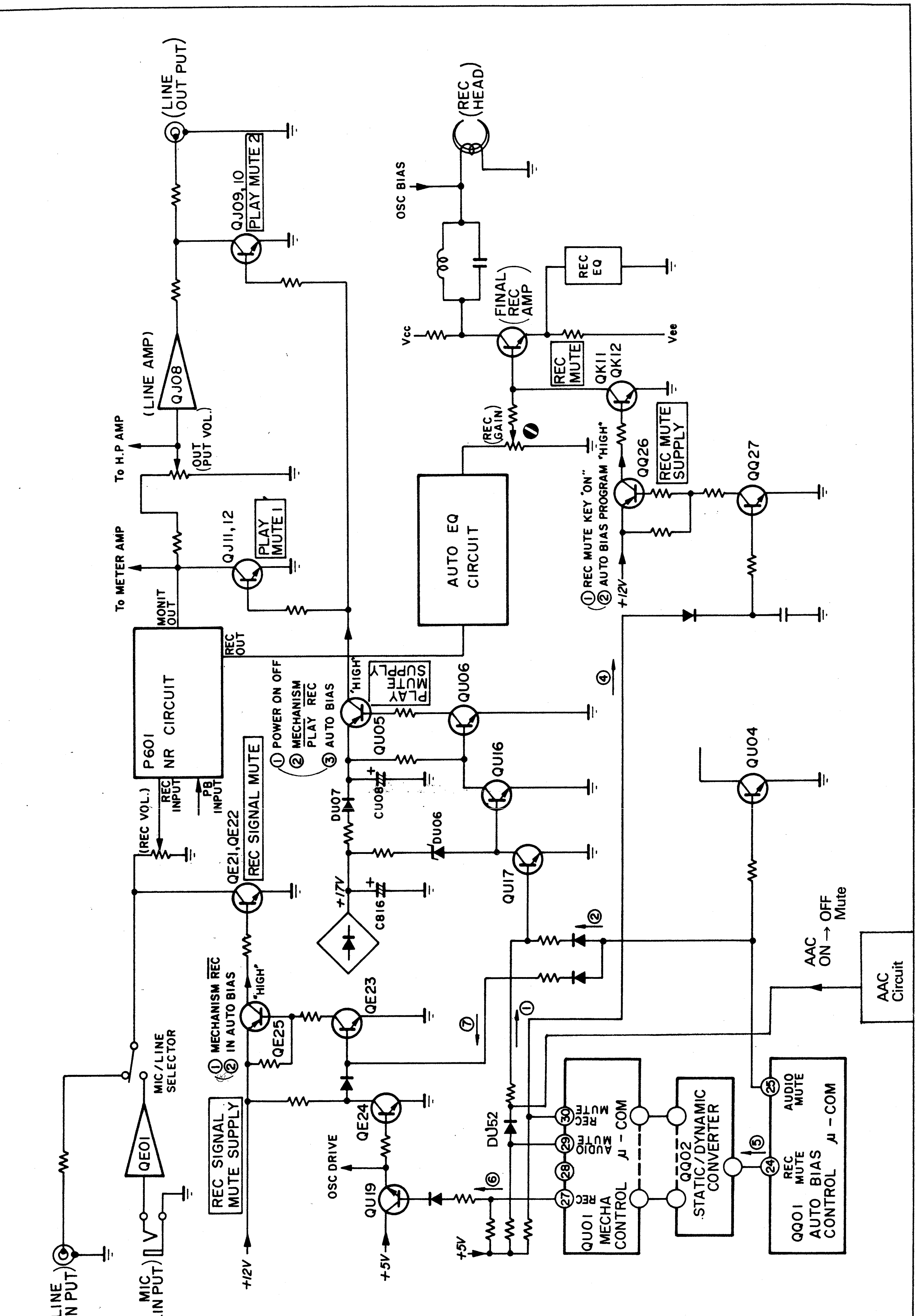
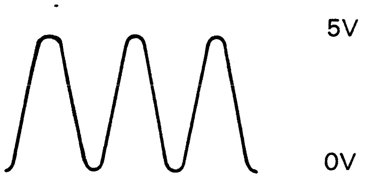

(LINE INPUT)
(MIC INPUT)
QE01
MIC/LINE SELECTOR
(REC VOL.)
QE21,QE22
REC SIGNAL MUTE
REC SIGNAL MUTE SUPPLY
① MECHANISM REC
② IN AUTO BIAS
"HIGH"
QE25
QE23
QE24
OSC DRIVE
QU19
+12V
+5V
+17V
C816
DU07
CU08
DU06
① POWER ON OFF
② MECHANISM PLAY REC
③ AUTO BIAS
"HIGH"
QU05
QU06
PLAY MUTE SUPPLY
QU16
QU17
P601
NR CIRCUIT
REC INPUT
PB INPUT
MONIT OUT
REC OUT
To METER AMP
To H.P AMP
(OUT PUT VOL.)
QJ11,12
PLAY MUTE 1
(LINE AMP)
QJ08
QJ09,10
PLAY MUTE 2
(LINE OUT PUT)
AUTO EQ CIRCUIT
(REC GAIN)
OSC BIAS
(REC HEAD)
Vcc
Vee
(FINAL REC AMP)
REC EQ
REC MUTE
QK11
QK12
① REC MUTE KEY "ON"
② AUTO BIAS PROGRAM "HIGH"
QQ26
REC MUTE SUPPLY
QQ27
QU04
AAC ON → OFF Mute
AAC Circuit
DU52
+5V
QU01 MECHA CONTROL μ-COM
27 REC
28
29 AUDIO MUTE
30 REC MUTE
QQ02 STATIC/DYNAMIC CONVERTER
QQ01 AUTO BIAS CONTROL μ-COM
24 REC MUTE
25 AUDIO MUTE
①
②
④
⑤
⑥
⑦

Figure 23

M2378

5.10 CHECKING VOLTAGE OUTPUT AT PINS OF QU01

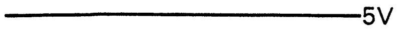
①



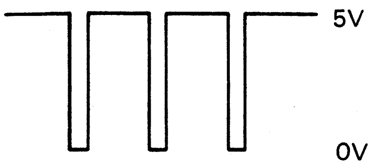
f:400KHz

④ N.C

②③⑤ No cassette tape is mounted



With a cassette tape mounted

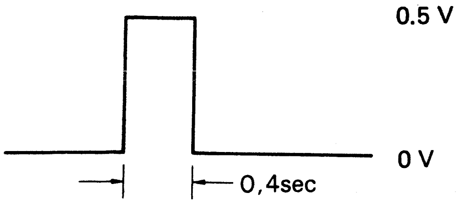


⑥⑦⑧ 5V

⑨⑩⑪ N.C

⑫ For PLAY 0.5V and for other modes 0 V

⑬ Brake



⑭ For PLAY 0.5V and for other modes 0 V

⑮ For REC 0.5 V and for other modes 3 V

⑯ For PAUSE 0.5 V and for other modes 3 V

⑰ For PLAY 0.5 V and for other modes 3 V

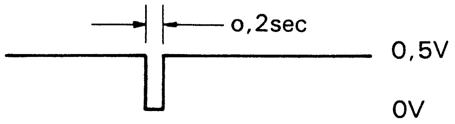
⑱ For REW 0.5 V and for other modes 3V

⑲ For FF 0.5 V and for other modes 3V

⑳㉑ GND

㉒ For PLAY 0.5 V and for other modes 3 V

㉓ With each plunger turned on:



㉔ For REW 0V and for other modes 5 V

㉕ For FF/PLAY 0 V and for other modes 5 V

㉖ N.C

㉗ For REC 5 V and for other modes 0 V

㉘ For REC/PLAY 0 V and for other modes 5 V

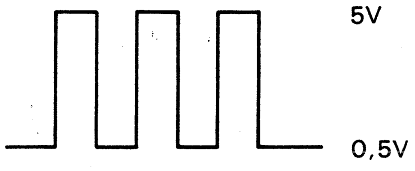
㉙ For PLAY, REC/PLAY and REC/PAUSE 0 V and for other modes 3 V

㉚ For FF and REW 3 V and for other modes 0 V

㉛ With the REC/MUTE or SKIP MEMO button pressed 2 V; otherwise 0 V

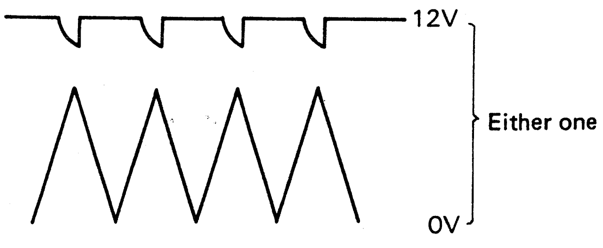
㉜ N.C

㉝ For PLAY, FF and REW:



For STOP or PAUSE 5 V or 0.5 V

㉞ PLAY or SKIP (A recorded tape is used):



For other modes 0 V

㉟ With an erroneous erasure proof cassette mounted 0 V; otherwise 5 V

㊱ With a cassette tape mounted 0 V; otherwise 5 V

㊲㊳㊴㊵ (With no buttons pressed) 5 V

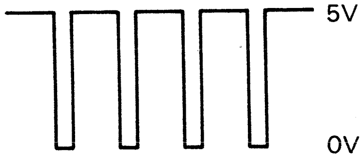
With one of the above buttons pressed

m2379

㊲ Rec Mute
Skip Memo

㊳ Rec FF

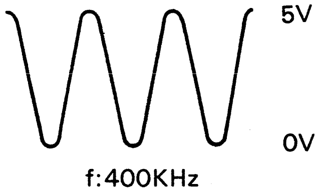
㊴ Play ReW
Timer Rec
Timer play



㊵ Stop Pause

㊶ VDD

㊷



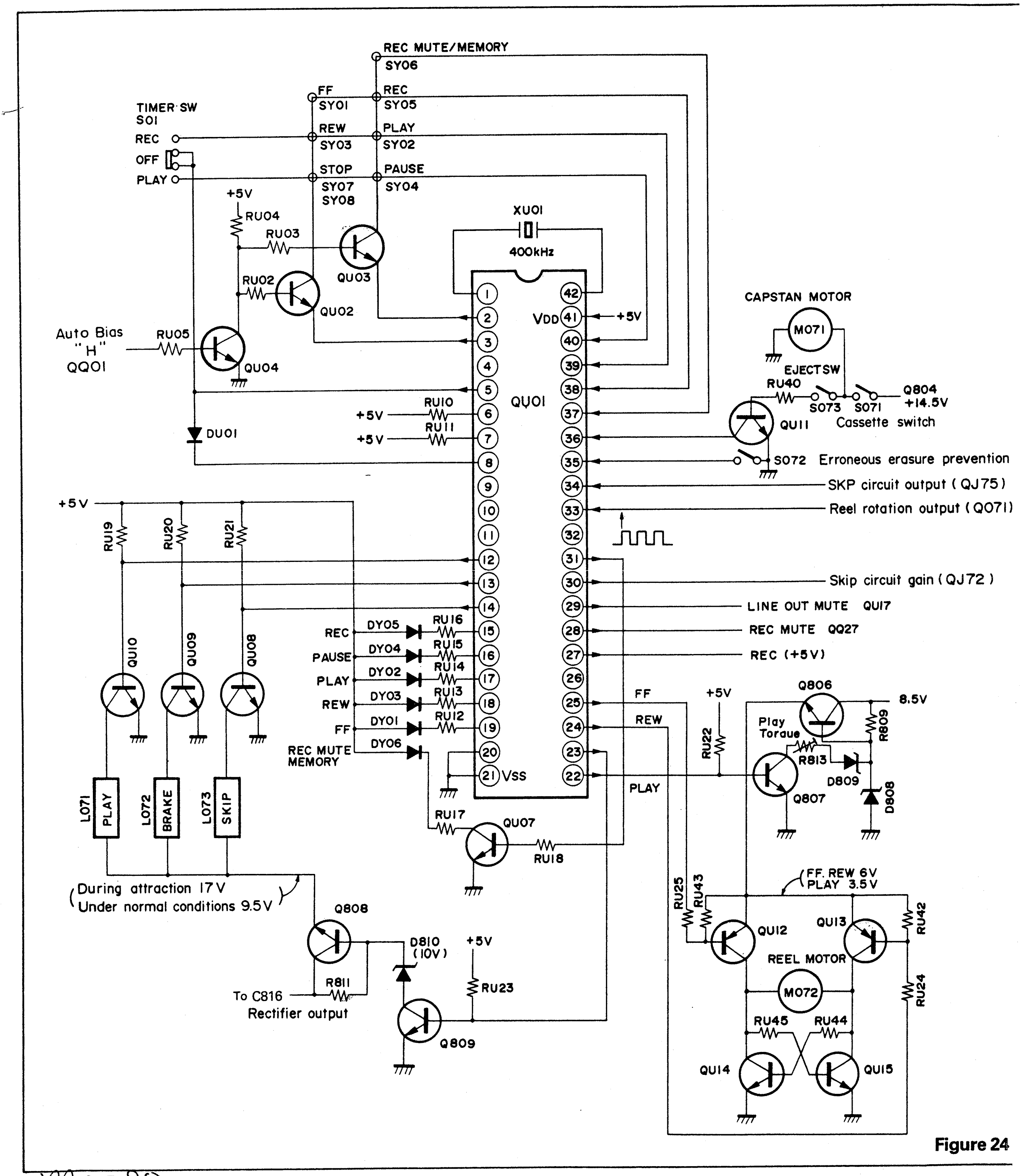

REC MUTE/MEMORY
SY06
FF
SY01
REC
SY05
REW
SY03
PLAY
SY02
STOP
SY07
SY08
PAUSE
SY04
TIMER SW
S01
REC
OFF
PLAY
+5V
RU04
RU03
RU02
QU03
QU02
Auto Bias
"H"
QQ01
RU05
QU04
DU01
XU01
400kHz
VDD
+5V
QU01
RU10
RU11
+5V
+5V
Vss
CAPSTAN MOTOR
M071
EJECT SW
RU40
S073
S071
Q804
+14.5V
Cassette switch
QU11
S072 Erroneous erasure prevention
SKP circuit output (QJ75)
Reel rotation output (Q071)
Skip circuit gain (QJ72)
LINE OUT MUTE QU17
REC MUTE QQ27
REC (+5V)
RU19
RU20
RU21
QU10
QU09
QU08
REC
PAUSE
PLAY
REW
FF
REC MUTE
MEMORY
DY05
DY04
DY02
DY03
DY01
DY06
RU16
RU15
RU14
RU13
RU12
L071 PLAY
L072 BRAKE
L073 SKIP
RU17
QU07
RU18
FF
REW
PLAY
+5V
RU22
Q806
8.5V
Play Torque
R813
R809
D809
D808
Q807
During attraction 17V
Under normal conditions 9.5V
Q808
D810
(10V)
+5V
R811
To C816
Rectifier output
RU23
Q809
RU25
RU43
FF. REW 6V
PLAY 3.5V
QU12
QU13
RU42
REEL MOTOR
M072
RU24
RU45
RU44
QU14
QU15

Figure 24

M2380

5.11 OPERATING PRINCIPLES OF THE SD930 dbx SYSTEM

- Encoding
  The input signal is compressed to 1/2 according to the recording characteristic (REC) shown in Figure 25 before it is sent to the deck's recording circuits, so that signals of high levels are not affected by saturation of tape and those of low levels not affected by tape hiss.
- Decoding
  The playback output of the deck is sent to the decoder which expands the signal by doubling it according to the playback characteristic (PLAY) shown in Figure 25. Thus the signals compressed and recorded restore their original levels and they may have a dynamic range twice as large as of the tape. Compression and expansion are linear on logarithmic scales, regardless of frequency.

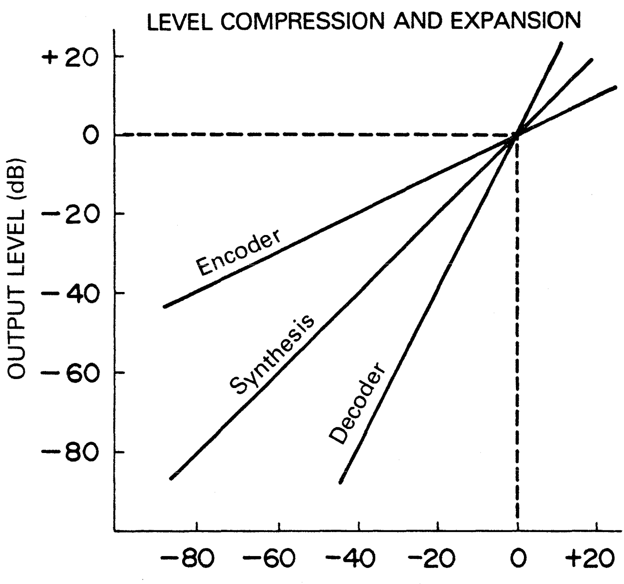


Figure 25

Block diagram

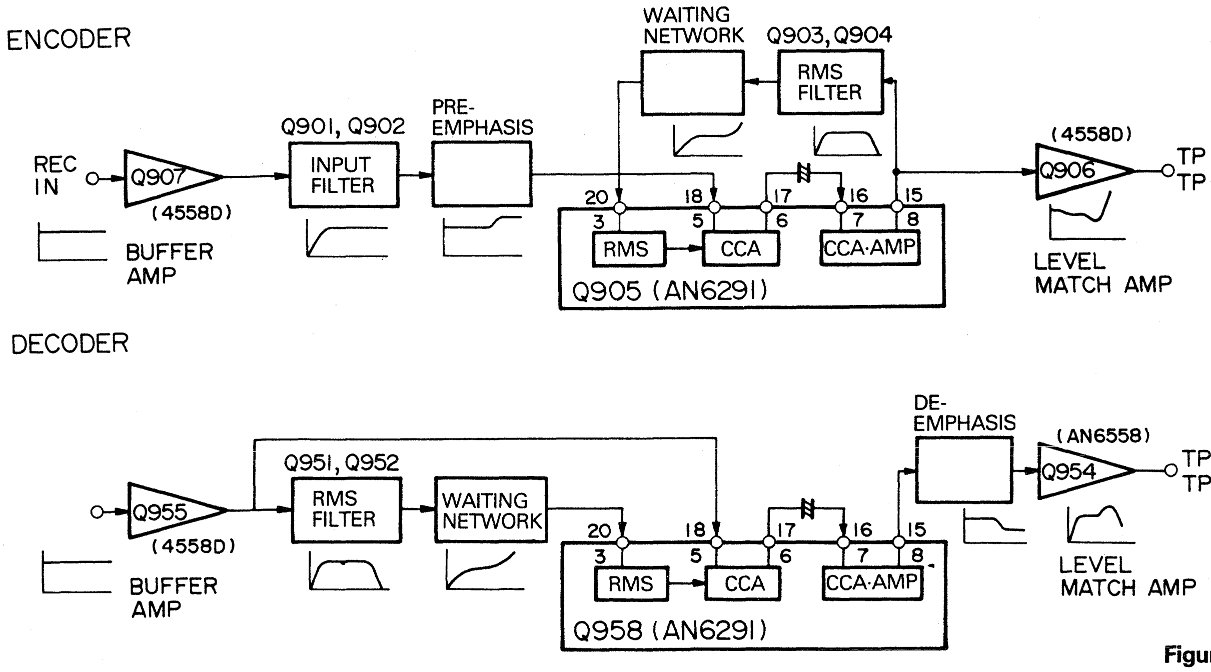

ENCODER
REC IN
Q907
(4558D)
BUFFER AMP
Q901, Q902
INPUT FILTER
PRE-EMPHASIS
WAITING NETWORK
Q903, Q904
RMS FILTER
20
18
17
16
15
3
5
6
7
8
RMS
CCA
CCA·AMP
Q905 (AN6291)
(4558D)
Q906
TP 5
TP 6
LEVEL MATCH AMP
DECODER
Q955
(4558D)
BUFFER AMP
Q951, Q952
RMS FILTER
WAITING NETWORK
20
18
17
16
15
3
5
6
7
8
RMS
CCA
CCA·AMP
Q958 (AN6291)
DE-EMPHASIS
(AN6558)
Q954
TP 7
TP 8
LEVEL MATCH AMP

Figure 26

The frequency characteristics of the encoder and decoder are determined with external Capacitors and Resistors connected to AN6291.

Characteristics of encoder and decoder

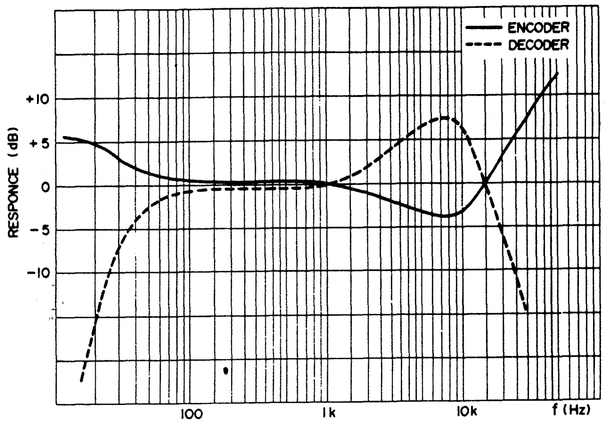


Figure 27

M2301

5.11.1 Reference level

The reference level of AN6291 is 20mVRMS and the output stage has a gain which is large enough for level matching with the Dolby output stage. The filter input stage includes a buffer amplifier which prevents reduction of level which might cause at high frequencies due to the output impedance of the preceding stage. This buffer amplifer also prevents reduction of input impedance for line input.

5.11.2 Dolby level dbx reference level

To raise saturation level sufficiently, the dbx reference level of 20mV is lowered for the Dolby level of 0 dB. As a result, if the dbx reference level is assumed as 0 dB when the 3% distortion level is +5 dB, the maximum recording level (3% distortion) is +10 dB. If the dbx reference level is assumed as −5 dB, the maximum recording level (3% distortion) is +20 dB, with the rise of 10 dB. To make use of the characteristic of dbx (expansion of dynamic range) completely, the reference level is set at −4 dB with reference to the ⅮⅮ level during recording. The dbx encoder output level during proper recoding mode and the dbx decoder output level during proper playback mode (with MTT-150) are as follows.

Table 7

	TEST POINT	OUTPUT
ENCODER	5, 6	306.5 mV
DECODER	7, 8	871 mV

5.11.3 Timing current adjustment

Input 1 kHz/20 mV signal to both channels of the encoder and decoder.

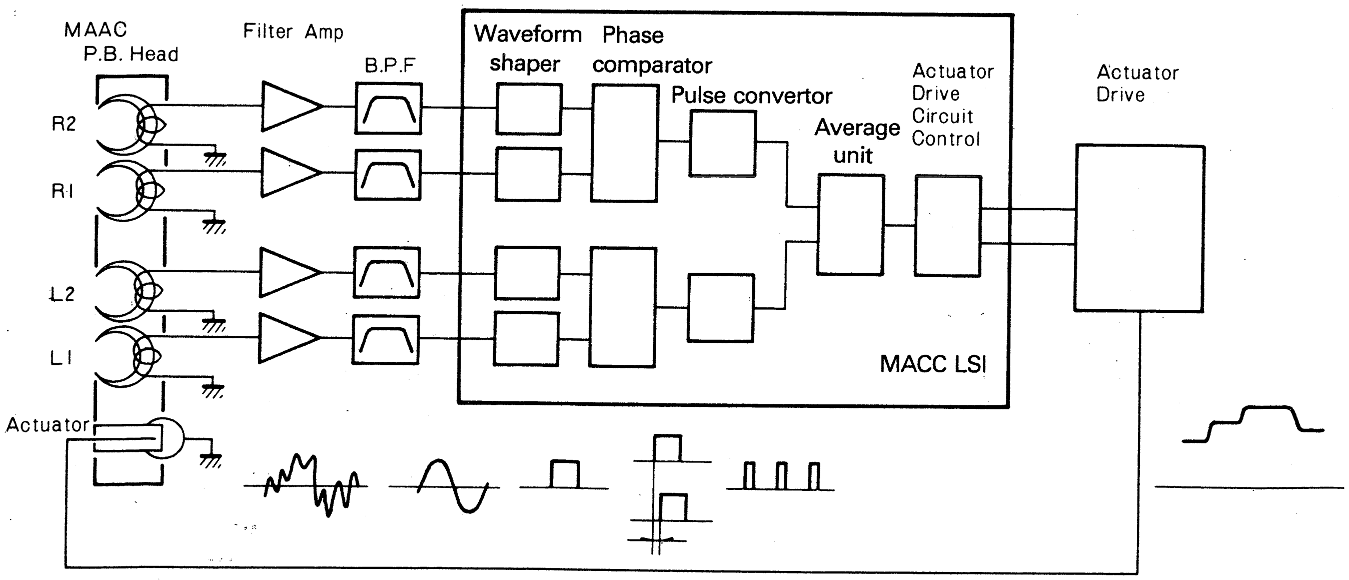
a. Decoder
   Measure voltage across R791 (1 kohms) (across TP11 and TP12). Adjust semi-fixed variable resistor R792 so that the voltage become 15.0 mV.

b. Encoder
   Measure voltage across R949 (1 kohms) (across TP9 and TP10). Adjust semi-fixed variable resistor R950 so that the voltage become 15.0 mV.
   - Use a DC voltmeter to measure voltage.

6. MARANTZ AUTOMATIC AZIMUTH CONTROL SYSTEM (M.A.A.C)

6.1 OPERATIONAL DESCRIPTION

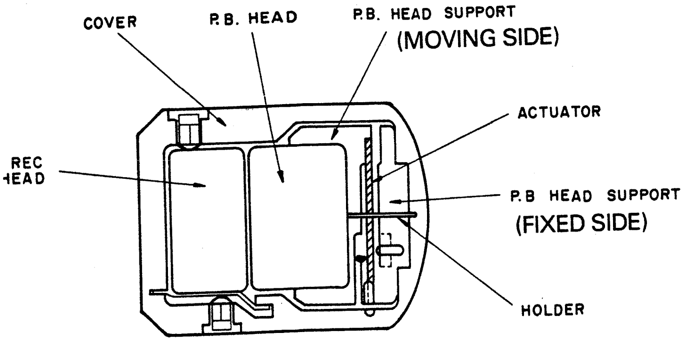
1. The tape is played back using a head with a special gap so the track width is 1/2 track width of the conventional.
2. The high and middle frequency components are degraded by the azimuth of the individual tracks, of the stereo signal are eliminated.
3. The phase difference between the 2 channels is detected.
4. The head azimuth is automatically adjusted to eliminate the phase difference with a signal proportion to the phase difference.



M2382

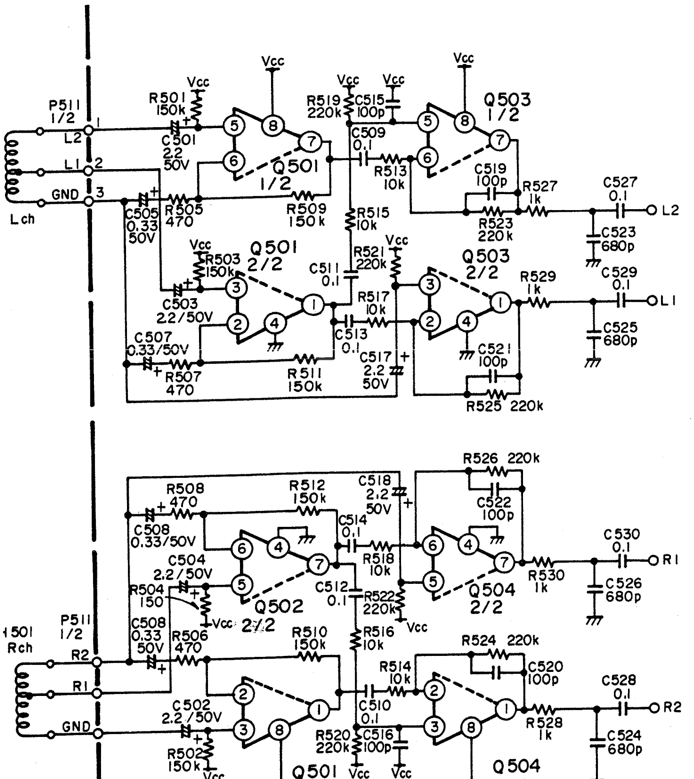
6.2 MAAC HEAD DESCRIPTION

1. The head uses a rec/play combination 3-head system.
2. The play head has an actuator as shown in the figure.
3. The actuator consistes of a piezo-ceramic electric element. The play head azimuth is adjusted according to the deviation due to the voltage (about −140V∼+140VDC) applied to both terminals of the element.


COVER
P.B. HEAD
P.B. HEAD SUPPORT (MOVING SIDE)
ACTUATOR
REC HEAD
P.B HEAD SUPPORT (FIXED SIDE)
HOLDER

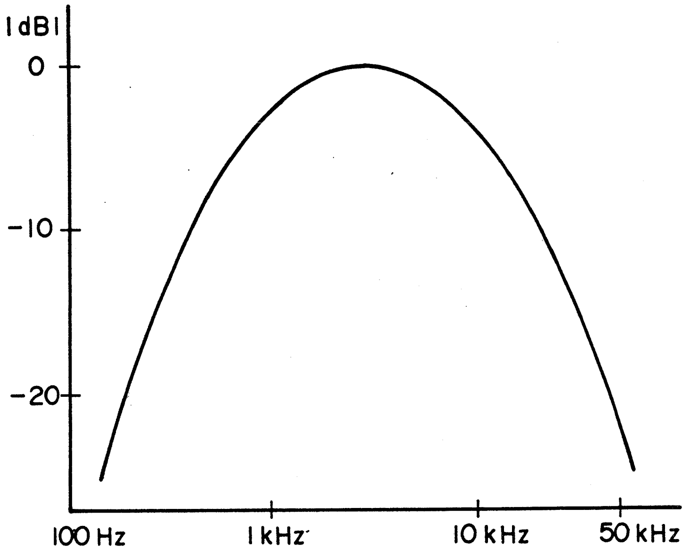
MAAC HEAD CONSTRUCTION (REAR SIDE)

6.3 CIRCUIT DESCRIPTION


P511 1/2
L2
L1
GND
Lch
Vcc
R501 150k
C501 22 50V
Q501 1/2
R519 220k
C515 100p
C509 0.1
R513 10k
Q503 1/2
C519 100p
R527 1k
C527 0.1
L2
R505 470
C505 0.33 50V
R509 150k
R515 10k
R523 220k
C523 680p
R503 150k
Q501 2/2
C511 0.1
R521 220k
Q503 2/2
R529 1k
C529 0.1
L1
C503 2.2/50V
R517 10k
C513 0.1
C525 680p
C507 0.33/50V
R507 470
R511 150k
C517 2.2 50V
C521 100p
R525 220k
R508 470
R512 150k
C518 2.2 50V
R526 220k
C522 100p
C508 0.33/50V
C514 0.1
R518 10k
C530 0.1
R1
C504 2.2/50V
R504 150
C512 0.1
R522 220k
Q504 2/2
R530 1k
C526 680p
Q502 2/2
C508 0.33 50V
R506 470
R510 150k
R516 10k
R524 220k
P511 1/2
P501 Rch
R2
R1
GND
R514 10k
C520 100p
C528 0.1
R2
C502 2.2/50V
C510 0.1
R528 1k
R502 150k
R520 220k
C516 100p
C524 680p
Q501 1/2
Q504 1/2

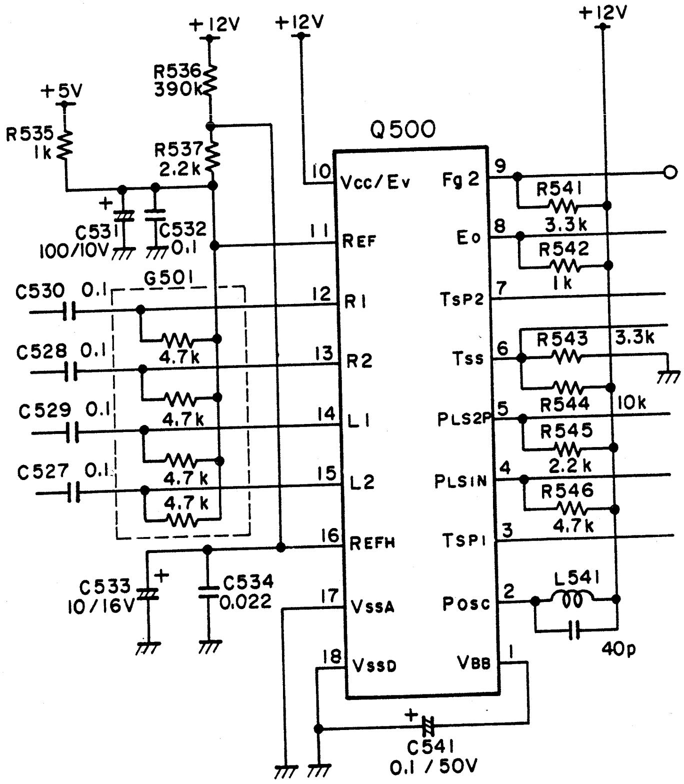
6.3.1 4-channel EQ amp (P505)

1. In the first stage, the signals from G-R1 and G-R2 are amplified and the signal is separated into G-R1 and R1-R2 in the later stage (same as L channel).
2. With these 2 stages, BPF characteristics with a center frequency 2kHz are obtained.
3. Each output is applied to the next stage (phase detector) (MAAC IC).
4. The total gain is 72 dB at 3kHz (peak).



EQ amp frequency characteristics

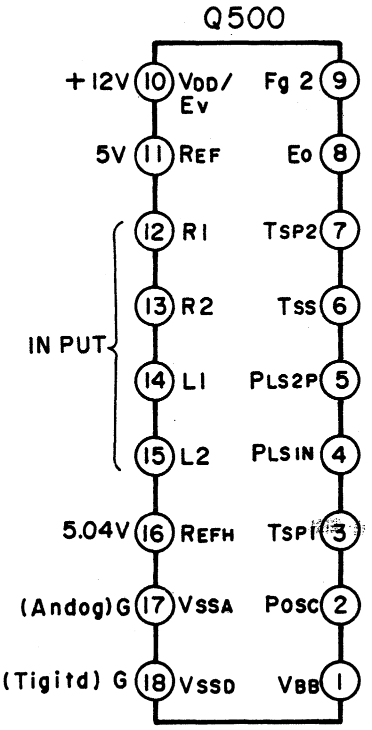
6.3.2 Peripheral circuit of MAAC IC (Q500)

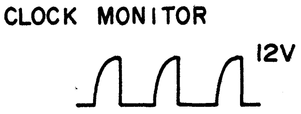

+12V
+12V
+12V
+5V
R536 390k
R535 1k
R537 2.2k
C531 100/10V
C532 0.1
C530 0.1
G501
C528 0.1
4.7k
C529 0.1
4.7k
C527 0.1
4.7k
4.7k
C533 10/16V
C534 0.022
Q500
10 Vcc/Ev
11 REF
12 R1
13 R2
14 L1
15 L2
16 REFH
17 VssA
18 VssD
9 Fg 2
8 Eo
7 TsP2
6 Tss
5 PLS2P
4 PLSIN
3 TSPI
2 Posc
1 VBB
R541
3.3k
R542
1k
R543 3.3k
R544 10k
R545
2.2k
R546
4.7k
L541
40p
C541 0.1 / 50V

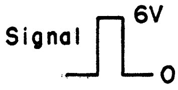
M2383

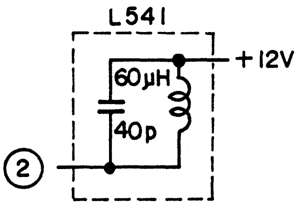
A. (Circuit description)

1. The L1, L2, R1 and R2 outputs are applied to pins ⑫ – ⑮, the signal above 6.4kHz is cut by the filter in each channel and signals 1 and 2 are phase compared.
2. The delay or advance between signals 1 and 2 is detected.
3. According to the delay or advance of the signal, a pulse is output via pins ③-⑦.
4. The outputs are as follows.
   - Switching the oscillator primary side
     TPS1: Pulse is output when L is advanced.
     TPS2: Pulse is output when L is delayed.
     The pulse polarity and level are changed.
   - Switching the oscillator secondary side
     PLS1N: Switched to (−) side when L is advanced.
     PLS2P: Switched to (+) side when L is delayed.
   - Monitor output (TSS): Signal is output to (−) or (+) side respectively when L is advanced or delayed.


Q500
+12V ⑩ VDD/Ev
Fg 2 ⑨
5V ⑪ REF
Eo ⑧
⑫ R1
TSP2 ⑦
⑬ R2
TSS ⑥
IN PUT
⑭ L1
PLS2P ⑤
⑮ L2
PLS1N ④
5.04V ⑯ REFH
TSP1 ③
(Andog) G ⑰ VSSA
POSC ②
(Tigitd) G ⑱ VSSD
VBB ①


CLOCK MONITOR
12V

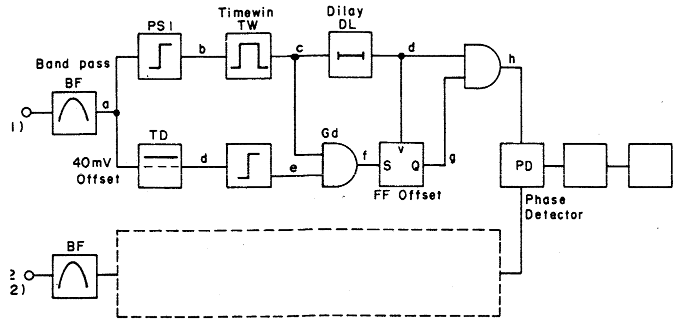



L541
+12V
60µH
40p
②

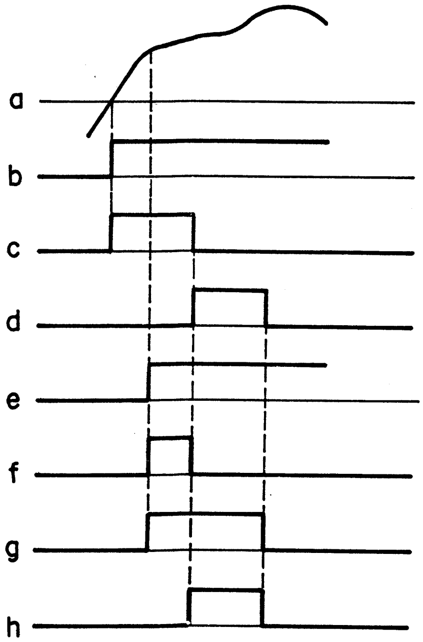
IC output	AAC OFF	AAC-ON W/OS	WS P.T.D	WS N.T.D
Tsp1	Hi-Tmp	L	P Puls	L
Tsp2	Hi-Tmp	L	L	P Puls
PLSIN	L	H	N Puls	H
PLS2P	H	L	L	P Puls
TSS			P Puls	N Puls
Trarsf Out	0	0	⊕	⊖

L···Low N···Negative
H···High P···Positive

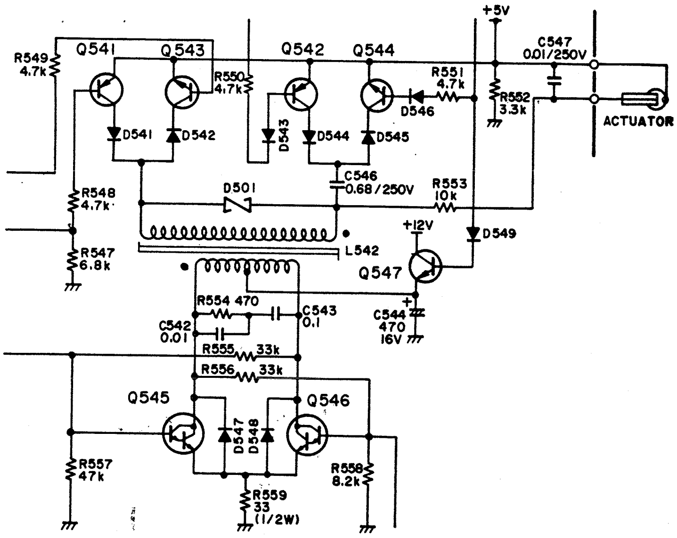
m 2384



Band pass
BF
PS I
Timewin
TW
Dilay
DL
TD
40mV
Offset
Gd
S
Q
FF Offset
PD
Phase
Detector
BF
a
b
c
d
e
f
g
h
v



6.3.3 Actuator Drive

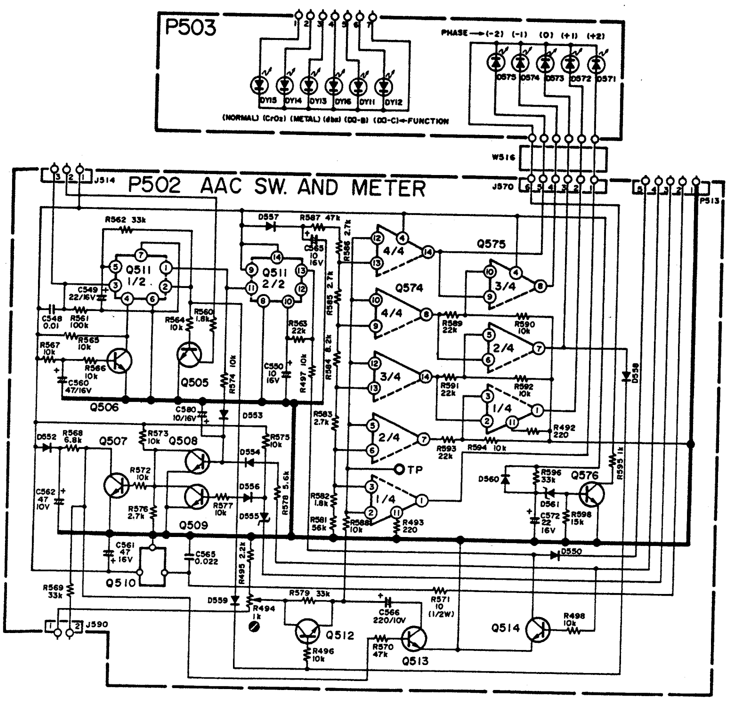


+5V
Q541
Q543
Q542
Q544
R549 4.7k
R550 4.7k
R551 4.7k
D546
R552 3.3k
C547 0.01/250V
ACTUATOR
D541
D542
D543
D544
D545
C546 0.68/250V
D501
R553 10k
R548 4.7k
R547 6.8k
L542
+12V
D549
Q547
R554 470
C543 0.1
C542 0.01
C544 470 16V
R555 33k
R556 33k
Q545
Q546
D547
D548
R557 47k
R558 8.2k
R559 33 (1/2W)

(Circuit description)

1. The voltage of DC12V applied to the center tap of transformer PRI is turned ON/OFF.
2. The polarity and level of the pulse generated at the primary side of the transformer are determined by the inputs at pin ③ (TSP1) and pin ⑦ (TSP2) of MAAC IC.
   The pulse generated at the secondary side of the transformer is integrated by C546 and used as the DC drive voltage of the actuator.
3. 150V zener diodes are connected on both ends of transformer SEC to rectify the signals.
4. The left 2 transistors switch the secondary signal whose polarity is determined by the MAAC IC output.
   The right 2 transistors are a bi-directional switch which turns ON when MAAC is ON.
5. Capacitor C547 connected on the secondary side is for the demagnetization the actuator (piezo-ceramic element) which turns MAAC ON/OFF due to the transformer secondary inductance and oscillator.

6.3.4 MAAC ON/OFF Switching and Phase Meter Circuit



P503
PHASE→(-2) (-1) (0) (+1) (+2)
D575 D574 D573 D572 D571
DY15 DY14 DY13 DY16 DY11 DY12
(NORMAL) (CrO2) (METAL) (dbx) (DD-B) (DD-C)←FUNCTION
W516
J514
P502 AAC SW. AND METER
J570
P513
Q511 1/2
Q511 2/2
Q505
Q506
Q507
Q508
Q509
Q510
Q574
Q575
Q576
Q512
Q513
Q514
TP
J590

m2385

A) MAAC ON/OFF Switching

1. The MAAC LED indicator is always ON unless the MAAC is turned OFF.
2. The MAAC circuit turns ON only in the playback mode.

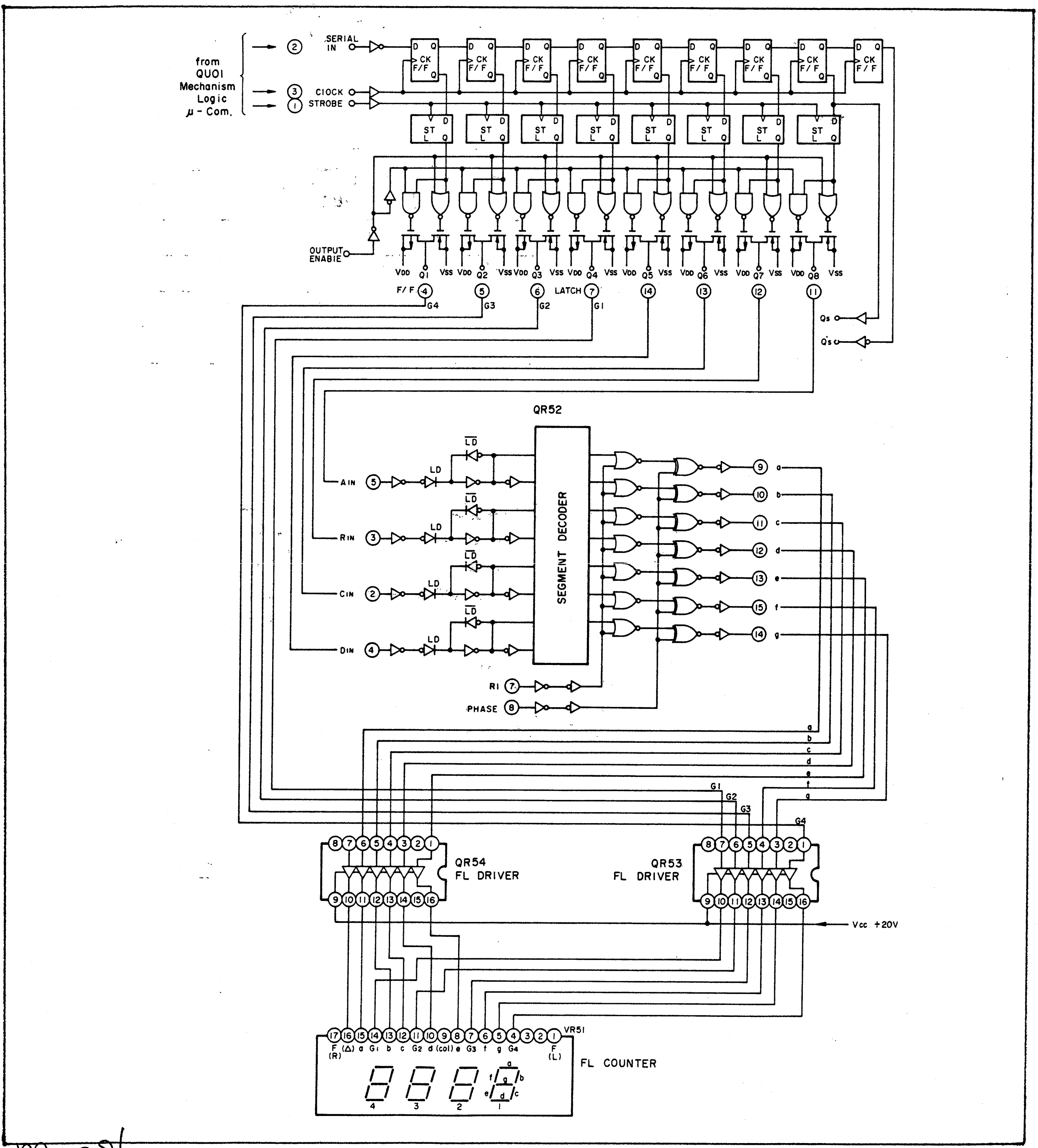
S541	MAAC ON					OFF
Function	Stop	Play	Pause	Rec	FF/Rew	(All Functico)
Indicator D551	ON	ON	ON	ON	ON	OFF
MAAC	OFF	ON	OFF	OFF	OFF	OFF

3. When theMAAC turns from ON to OFF, the actuator is de-magnetized and the audio mute signal is output during this period.

B) Phase Meter Circuit

1. The monitor output is from pin (6) of MAAC IC (Q500).
2. The phase meter consists of 5 LEDs and 1 equals about 6 minutes.

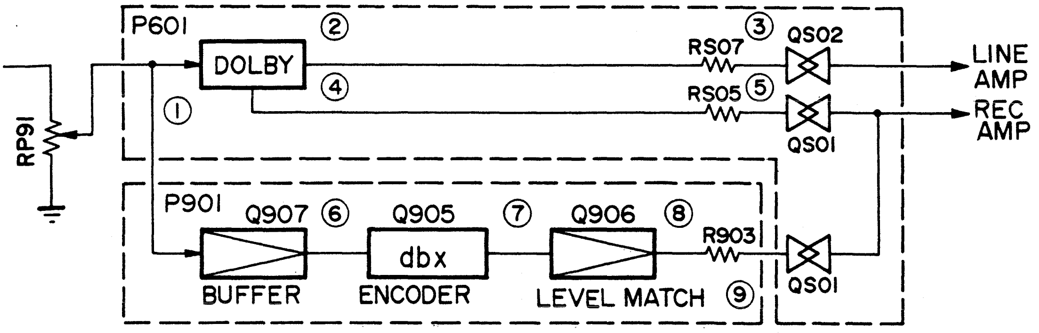
DIGITAL TAPE COUNTER LOGIC DIAGRAM

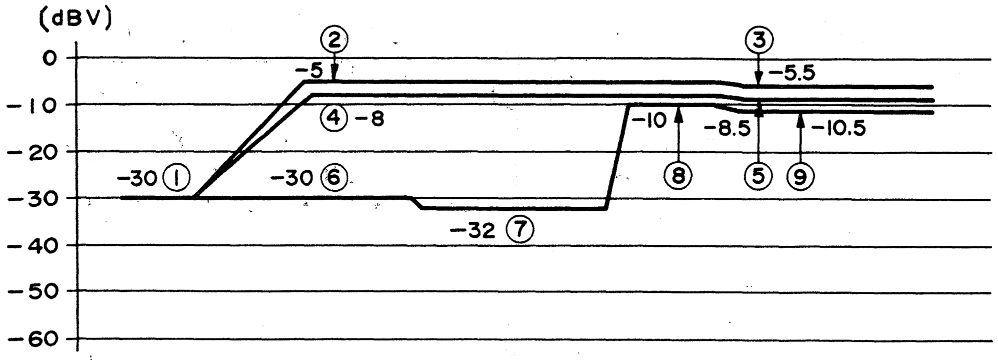


from QUOI Mechanism Logic μ - Com.
SERIAL IN
CIOCK
STROBE
D Q
CK F/F
ST L Q
OUTPUT ENABIE
VDD Q1 VSS VDD Q2 VSS VDD Q3 VSS VDD Q4 VSS VDD Q5 VSS VDD Q6 VSS VDD Q7 VSS VDD Q8 VSS
F/F
LATCH
G4
G3
G2
G1
Qs
Q's
QR52
SEGMENT DECODER
LD
AIN
BIN
CIN
DIN
RI
PHASE
a
b
c
d
e
f
g
QR54 FL DRIVER
QR53 FL DRIVER
Vcc +20V
VR51
F (Δ) a G1 b c G2 d e G3 f g G4 F
(R)
(L)
FL COUNTER
4
3
2
1

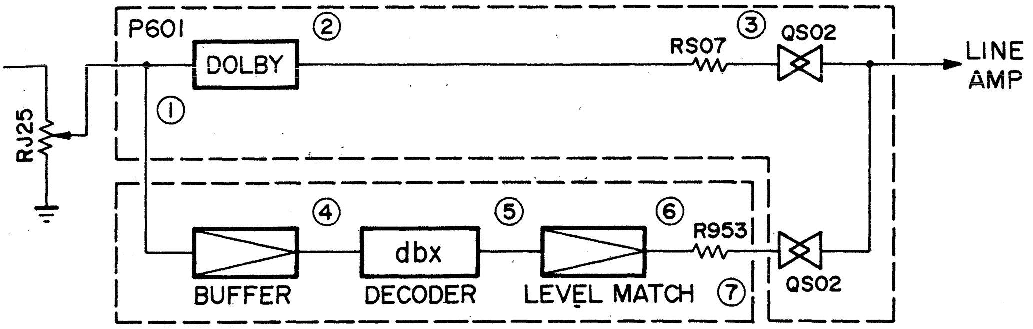
m2386

LEVEL DIAGRAM
RECODE MODE


P601
DOLBY
②
④
①
③
RS07
QS02
RS05
⑤
QS01
LINE AMP
REC AMP
RP91
P901
Q907
⑥
Q905
⑦
Q906
⑧
dbx
R903
BUFFER
ENCODER
LEVEL MATCH
⑨
QS01



PLAY BACK MODE


P601
DOLBY
②
①
③
RS07
QS02
LINE AMP
RJ25
④
⑤
⑥
R953
dbx
BUFFER
DECODER
LEVEL MATCH
⑦
QS02

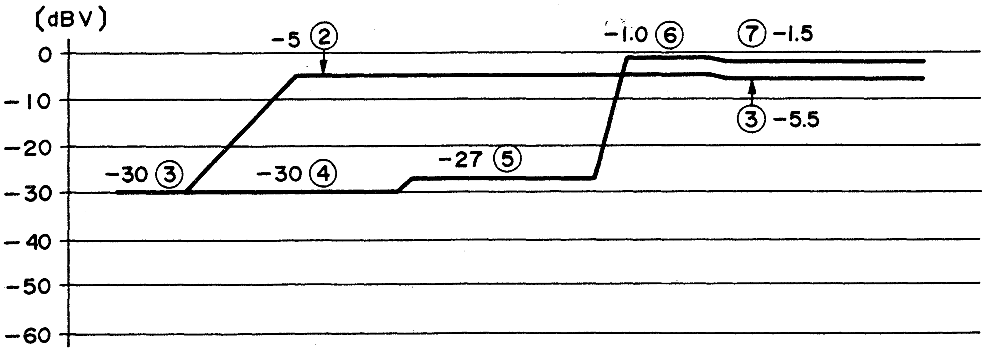


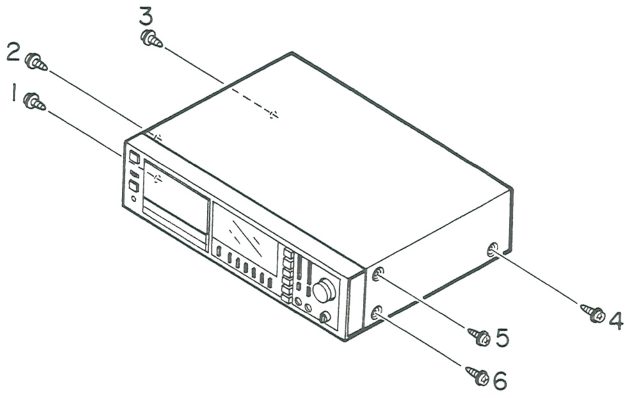
Figure 28

M12387

7. DISASSEMBLY

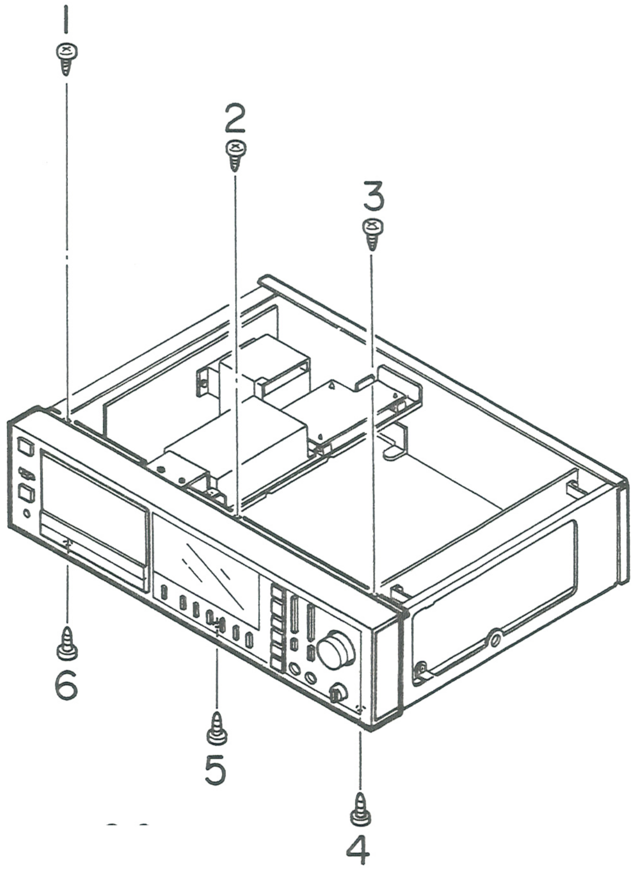
7.1 REMOVING THE TOP COVER

Remove screws (1) ~ (6). The top cover can now be removed.



7.2 REMOVING THE FRONT PANEL

Remove screws (1) ~ (6) and remove front panel frontwards.

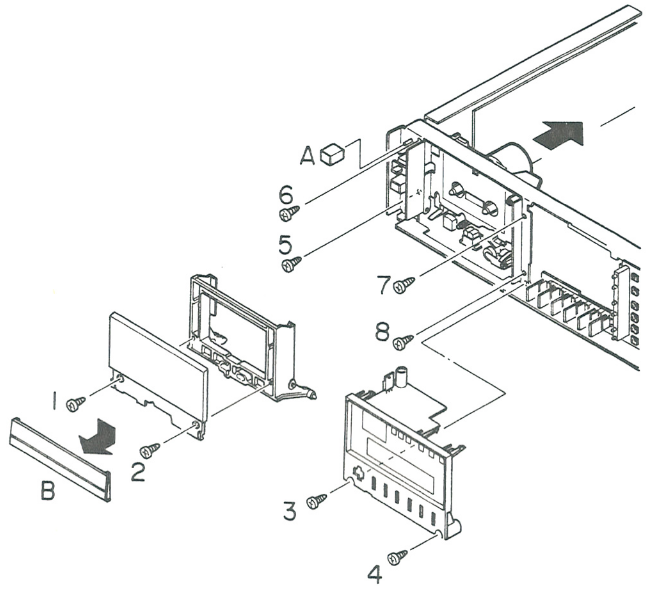


7.3 REMOVING THE CASSETTE ESCUTCHEON

Move escutcheon (B) downwards and remove frontwards. Remove screws (1) and (2).

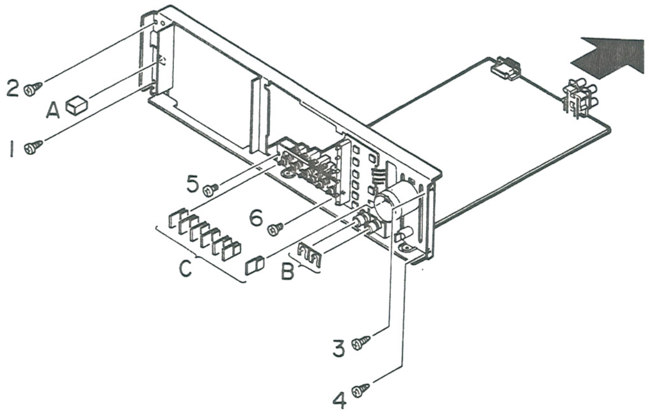
7.4 REMOVING THE CASSETTE MECHANISM

Remove screws (3) ~ (4) and remove meter holder. Remove eject button (A) and screws (5) ~ (8). The cassette mechanism can now be removed.



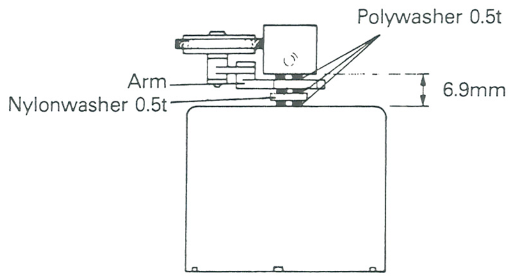
7.5 REMOVING THE MAIN P.W. BOARD

Remove screws (1) ~ (4) and power switch button (A) and separate the front chassis from the body. Remove stopper (B) and push knob (C). The main P.W. Board can be now be removed.



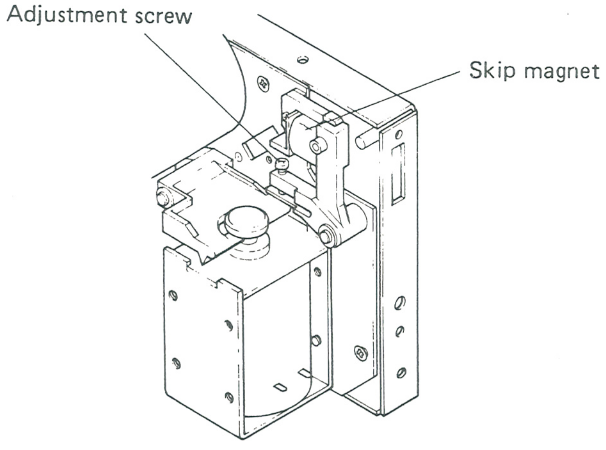
8. MECHANICAL ADJUSTMENT

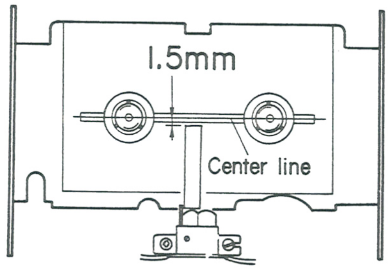
8.1 F/R MOTOR PULLEY POSITION



Insert the polywasher 0.5t, the nylon 0.5t, and poly washer 0.5t, the F/R arm and then the polywasher 0.5t into the F/R motor. Install the Pulley by attaching it firmly.
After installing the Pulley, make sure that the F/R arm can rotate easily and smoothly.
Note that the gap between the motor and the Pulley is approximately 6.9 mm.

8.2 ADJUSTMENT OF THE HEAD POSITION DURING CUE/ REC



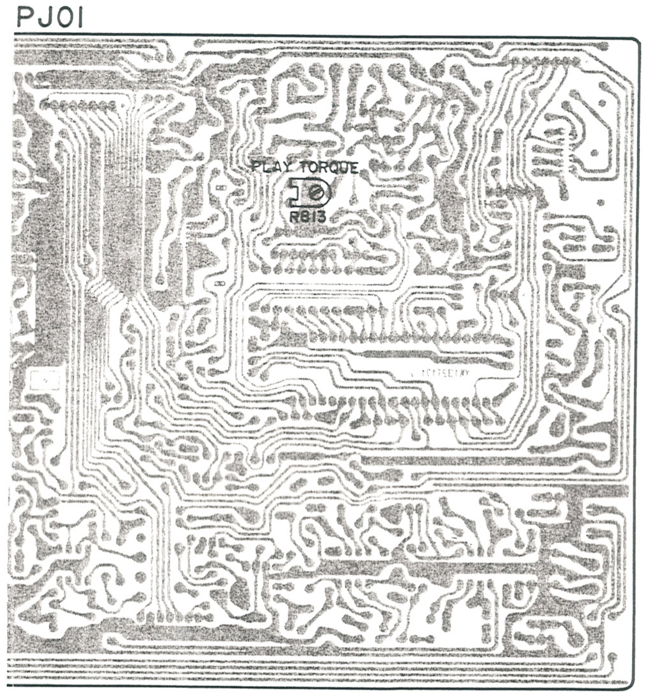


Set the operation of the mechanism to the CUE/SET mode and adjust the postition of the head using the M300 tool by turning the adjustment screw so that the head is located in a position 1.5 mm below the cente line.

8.3 PLAY TAKE-UP TORQUE

Please implement the following adjustment by using the torque meter of cassette type.
Adjust the semi-fixed resistor R813 so as to give a torque having a value in the range 35 to 50 g-cm.
In the mechanism of SD930. it is normal that the fluctuation of torque value is less than 15 g-cm.
The above torque range is the center value of fluctuation range.

PJ01 P.W. Board



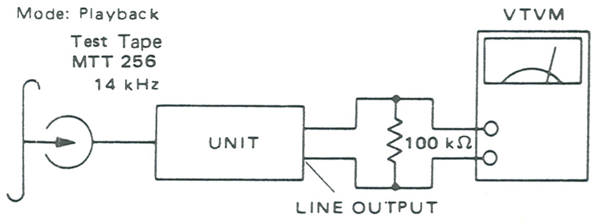
9. ELECTRICAL ADJUSTMENTS

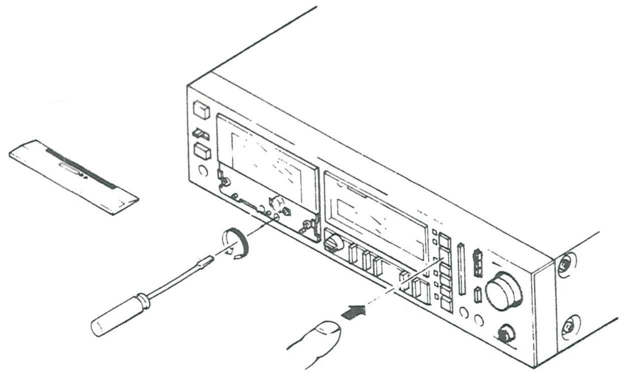
Precautions before Adjustment

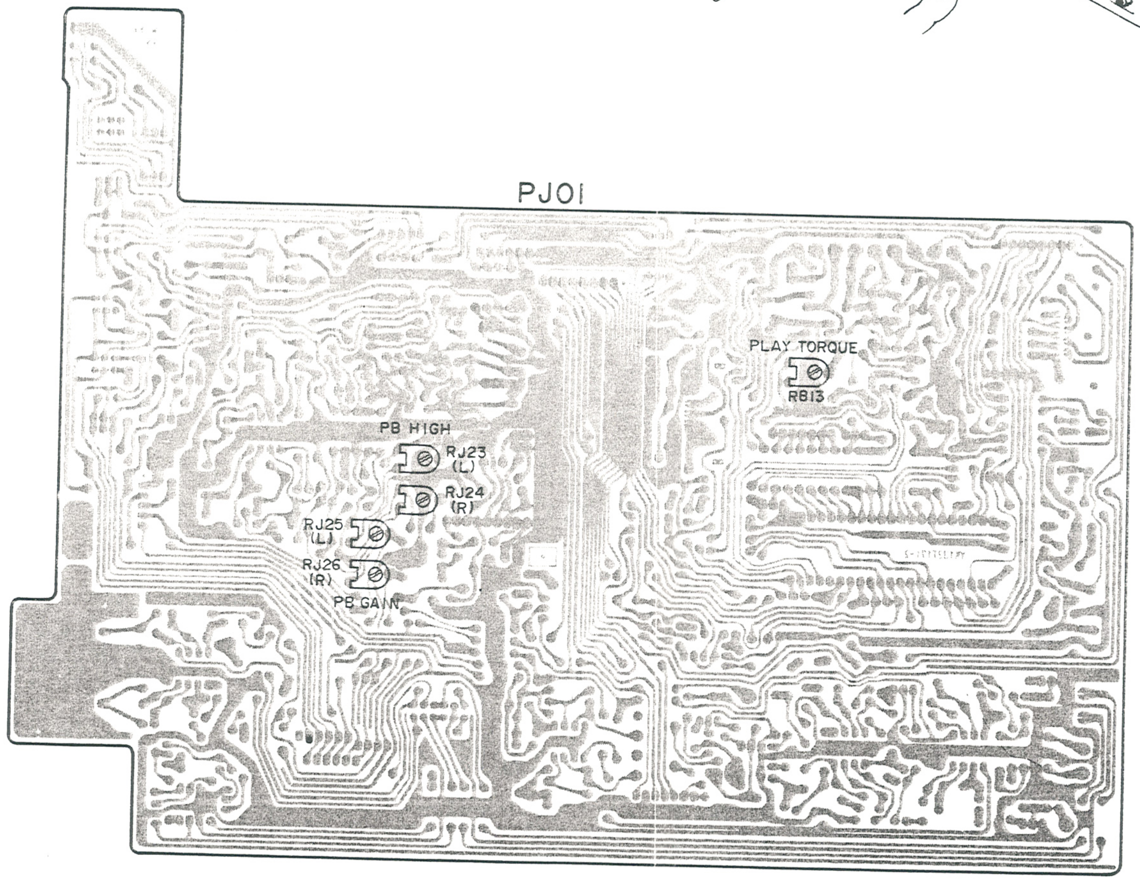
1. Before playing the test tape back, thoroughly demagnetize the heads, capstan and similar metal parts using an eraser as the test trape-recorded tone is easily erased.
2. Do not place the test tape on any measuring instrument.
3. Do not put the test tape near a place where the eraser is used.
4. Method of Demagnetization: — Turn the eraser power switch on at a remote position far away from the heads. Bring the eraser close to the heads, capstan and other parts to be demagnetized, and move it up and down four or five times to demagnetize. Slowly separate the eraser far away from the parts, and turn the power switch off.
5. Do not use any magnetize it from time to time in the course of each adjustment.
6. Do not turn semi-fixed resistor more than needed.
7. Do not apply locking bond excessively.

9.1 HEAD AZIMUTH ADJUSTMENT

1. Remove the cassette door lid and the escutcheon.
2. Set the TAPE SELECT switch to the NORM position.
3. Play the 14 kHz signal of the test tape MTT256, back. Adjust the head azimuth adjusting screw for maximum VTVM reading.
4. If the peak output reads of the right and left channels are different, set the screws to obtain the mechanical center between the peaks.
5. After adjustment, repeat the playback and stop setting a few times to make certain of no head azimuth deviation. Then, lock the screws with bond.


Mode: Playback
Test Tape
MTT 256
14 kHz
UNIT
100 kΩ
VTVM
LINE OUTPUT



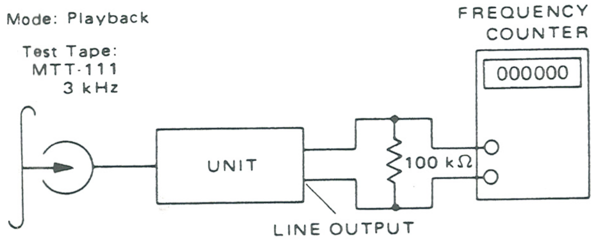

PJ01
PLAY TORQUE
RB13
PB HIGH
RJ23
(L)
RJ24
(R)
RJ25
(L)
RJ26
(R)
PB GAIN

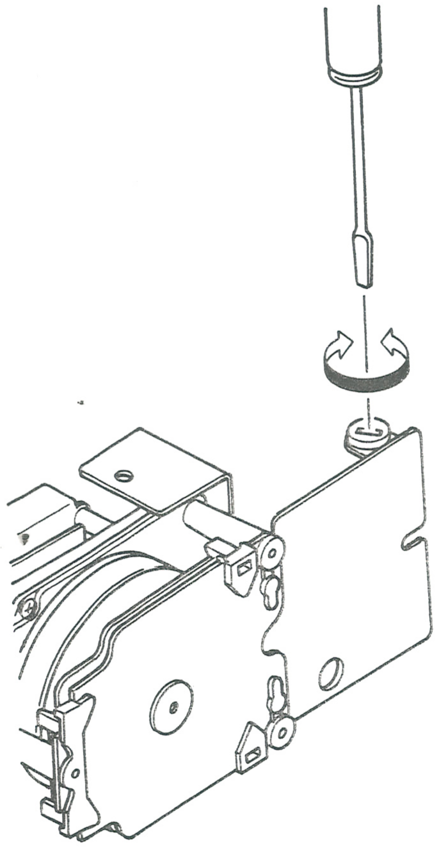
9.2 TAPE SPEED ADJUSTMENT

Play the 3 kHz signal of the test type MTT-111 back. Adjust the tape speed adjusting resistor inside the motor (M001) for 2990 to 3010 Hz counter indication.

NOTES:

1. **If a strong shock of similar vibration is applied to the back after adjustment, make certain that the measured tape speed had not changed.**
2. **Be careful that the frequency counter may indicate a wrong value because of too low counter input level.**
3. **Before adjustment, allow for 30 seconds or more after depressing of the PLAY button.**


Mode: Playback
Test Tape:
MTT-111
3 kHz
UNIT
100 kΩ
FREQUENCY
COUNTER
000000
LINE OUTPUT

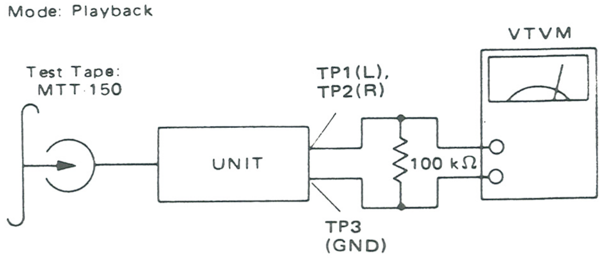


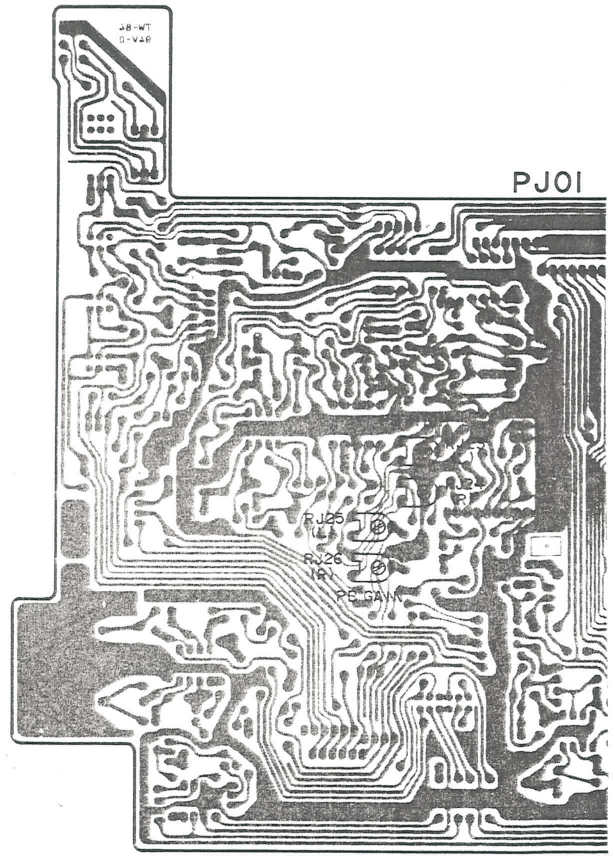
9.3 PLAYBACK OUTPUT LEVEL ADJUSTMENT

1. Set the TAPPE SELECT switch to the NORM position
2. Play the test tape MTT-150 back. Adjust RJ25(L) and RJ26(R) (50 kΩ each in PJ01) for 390 mV playback output level at the test points TP1(L) or, TP2(B) and TP3(GND) in P601. (Dolby NR P.W.B)

NOTES:

1. **Proceed both for the right and left channels in the same manner.**
2. **This adustment should be performed after the one for the "Playback Equalizer Adjustment".**


Mode: Playback
Test Tape:
MTT 150
UNIT
TP1(L),
TP2(R)
100 kΩ
VTVM
TP3
(GND)

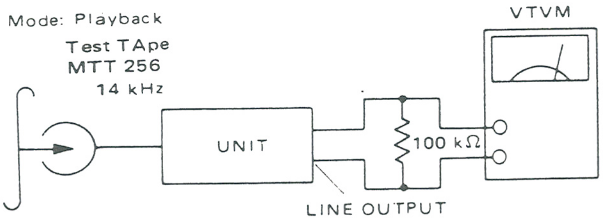

PJ01
RJ25
(L)
RJ26
(R)
PB GAIN

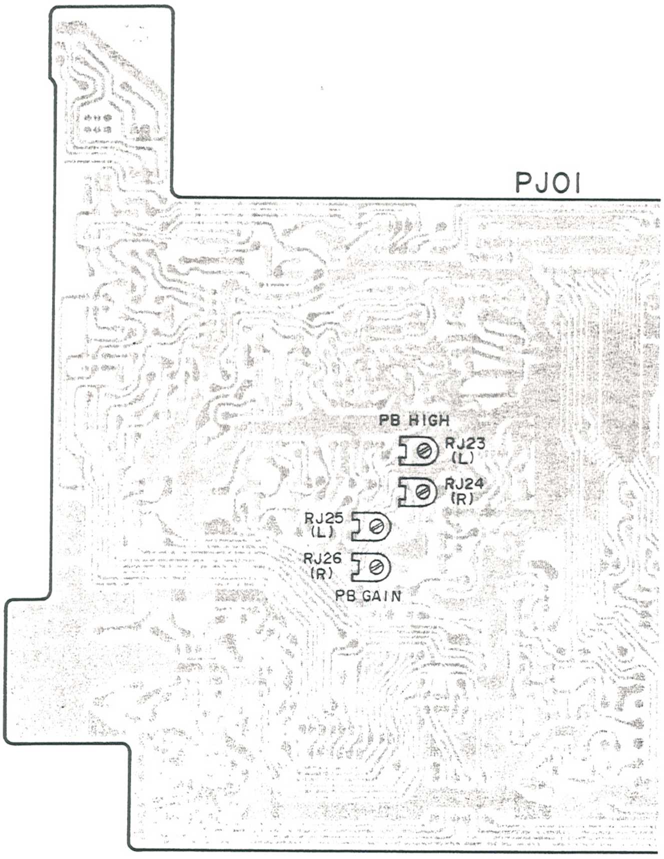
9.4 PLAYBACK EQUALIZER ADJUSTMENT

1. SELECT the NORM position of the TAPE SELECT switch.
2. Play the 315 Hz signal of the test tape MTT-256 back. Let the 315 Hz signal level be reference as 0 dB.
3. Play the 12.5 kHz signal of the test tape MTT-256 back. Adjust RJ23 (L) and RJ24 (R) (50kΩ each) for 12.5 kHz frequency response of 0 to −1 dB in reference to the 315 Hz signal level.

NOTES:

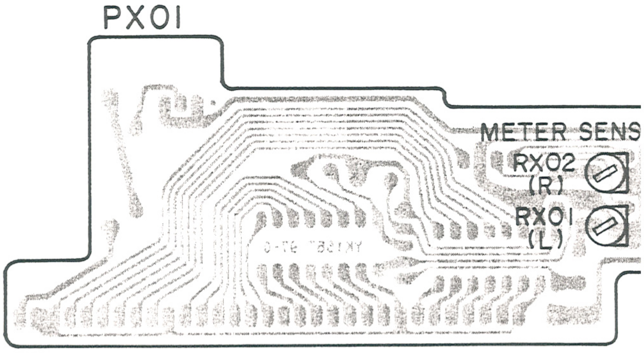
1. **Proceed both for the right and left channels in the same manner.**
2. **Note that clockwise turning of RJ23 (L) and RJ24 (R) will increase the 14 kHz signal output level.**





9.5 LEVEL PEAK LEVEL METER ADJUSTMENT

1. Follow the same procedures as in the "Playback Output Level Adjustment" section.
2. Adjust RX01 (L) and RX02 (R) (50kΩ each) for DO (+0dB) LED PEAK LEVEL meter reading.



9.6 ADJUSTMENT OF COMPU-BIAS

1. **Resetting COMPU-BIAS microprocessor (QQ01)**
   The microprocessor is provided with a HOLD function and it must be reset before making adjustment.
   - How to reset
     a. Short two PRESET pins.
     b. Ground TP06 for about a second, then open it. Now QQ01 is reset to the initial state. The data memory of QQ01 is reset to central values. The five-bit signal (00000 to 11111, or 0 to 31 in decimal) output through QQ01 pins ㉘ ~ ㉜ is 10000 (central value) 16) when reset.

NOTE: **Take not that "resetting" the COMPU-BIAS microprocessor differs from "resetting" the COMPU-BIAS keyboard.**

2. Setting reference voltage
   (After resetting the microprocessor)
   a. Adjust RK11 so that the level at TP01 become 0.6 V DC.
   b. Adjust RK12 so that the level at TP02 become 0.6V DC.
3. Adjustment of test signal oscillator output
   a. Connect a VTVM to TP04.
   b. Depress keys "AUTO" and "START" to auto-start COMPU-BIAS. During 6.5 seconds after start (TEST OSC generates 1 kHz), adjust RQ18 so that 12.7 mV develop at TP04. If adjusitment is not completed during that time, depress the RESET key to stop AUTO operation, then auto-start COMPU-BIAS and make adjustment again.
4. Provisional setting of recording bias
   - Reset QQ01.
   - Select NORMAL tape position.

   1. Put the deck in REC PAUSE mode and connect a VTVM to TP (L), TP (R), and G-GND
   2. Adjust RL59 so that 10 mV AC (bias current: 1 mA) develop at TP (L).
   3. Adjust RL60 so that 10 mV AC (bias current: 1 mA) develop at TP (R).
   4. Select CrO_2 tape position and check that level is 15~16 mV at each of TP (L) and TP (R).
   5. Select METAL tape position and check that level is 24~25 mV at each of TP (L) and TP (R).
      (The voltages given are the values developing with reference to GND.)

5. Setting recording bias peak
   - Reset QQ01.
   - Select NORMAL tape position.
   - Tape: AC212.
   - RK75 and RK76: at center
   1. Auto-start the deck and wait until the READY LED lights.
   2. In REC PAUSE mode, check voltage at TP (L) and TP (R) and G-GND.
   3. Reset QQ01.
   4. Put the deck in REC PAUSE mode, and adjust RL59 and RL60 so that the voltages become equal to those observed in step (2).

6. REC level adjustment
   - Input: −60 dB, 1 kHz, MIC Input
   - Tape position: NORMAL
   - Output: LINE OUT
   - Load resistance: 100 kohms
   - Tape: AC212
   - Reset QQ01.
   1. Enter signal through MIC and put the deck in proper drecording mode.
   2. Adjust RK75 (L) and RK76 (R) so that MONITOR OUT and recording/playback output become equal.

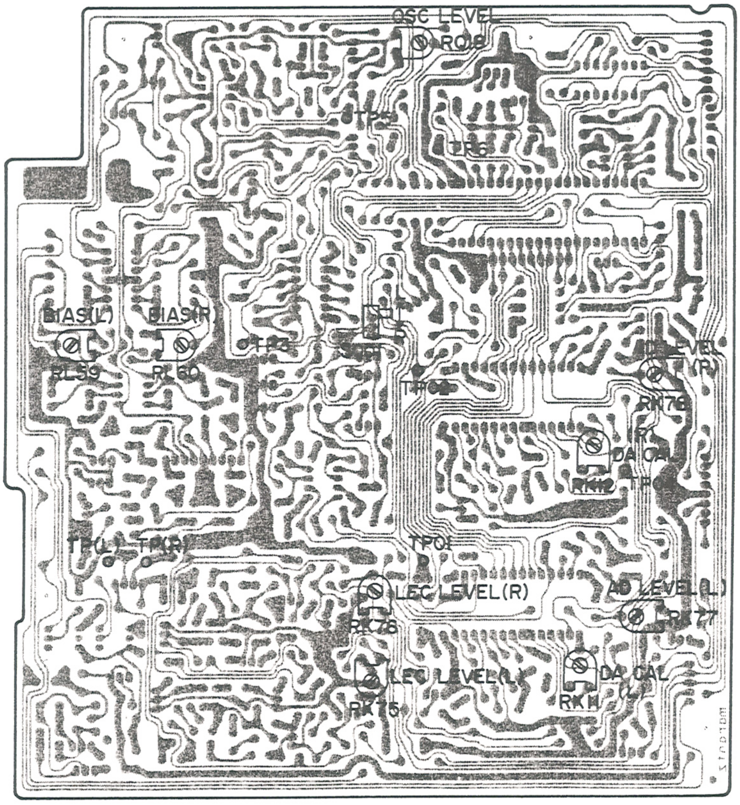
7. Setting AC/DC reference voltages
   - Reset QQ01.
   - Input: LINE IN, 1 kHz, 0 VU — 20 dB
   - Tape: AC212
   - SQ01: white side (L/ch)
   1. Connect a digital voltmeter across TP03 (HOT) and G (GND).
   2. Put the deck in REC mode.
   3. Adjust RK77 so that 0.59 V DC develop at TP03.
   4. Set SQ01 to the opposite (non-white) (R/ch) side and adjust RK78 so that 0.59 V DC develop at TP03.
   5. When adjustment is completed, set SQ01 to the white side (L/ch).
      - Be sure to follow the above adjustment procedures (otherwise the COMPU-BIAS might not operate properly).

8. Writing data in FACTORY SET MEMORY
   - Tape: AC212
   - Tape position: NORMAL
   1. Shot two PRESET pins.
   2. Auto-start the deck.
   3. When AUTO operation completes and the READY LED lights, the data set are automatically placed in NORMAL POSITION of FACTORY SET MEMORY.
   4. Perform steps (2) and (3) at each of tape positions CrO_2 (AC-512) and METAL (AC-711).
   5. Open the two PRESET pins.

NOTES:

1. **The data written in FACTORY SET MEMORY remain unchanged unless the pins get shorted.**
2. **Be sure to rewrite data in FACTORY SET MEMORY after battery replacement or repair made with wires disconnected from PW boards.**

PQ01

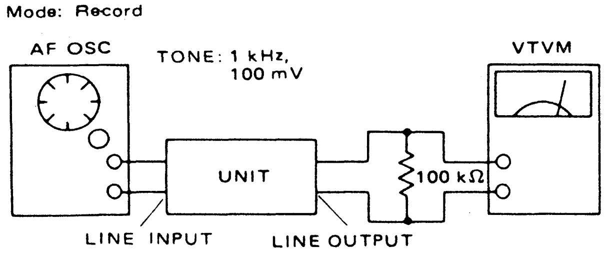


9.7 MPX FILTER ADJUSTMENT

1. Set the TAPE SELECT switch to the NORMAL position.
2. Connect the 1 kHz, 100 mV input signal to the LINE INPUT cord.
3. Set up the deck to the recording state.
4. Adjust the REC LEVEL control for 0 dB meter reading.
5. Adjust the line output level for 0 dB, and turn the DOLBY NR switch to the ON position.
6. Turn the input signal to the 19 kHz.
7. Adjust L601 (L) and L602 (R) in P601 (Dolby NR PWB) for minimum output level.

NOTES:

1. **Proceed both for the right and left channels in the same manner.**
2. **If the filter characteristic is better than 30 dB, the MPX filter needs not to be adjusted.**

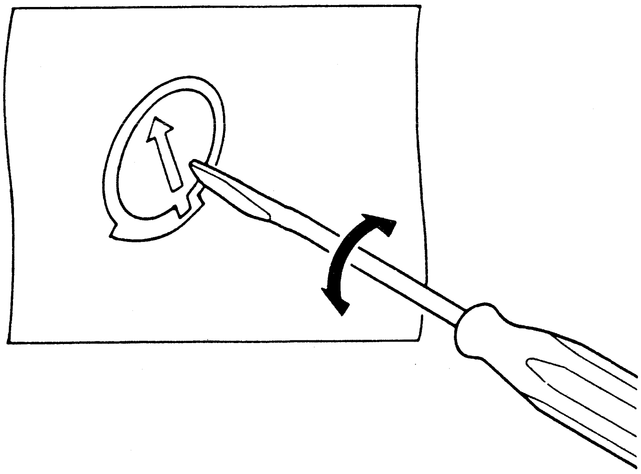

Mode: Record
AF OSC
TONE: 1 kHz, 100 mV
VTVM
UNIT
100 kΩ
LINE INPUT
LINE OUTPUT

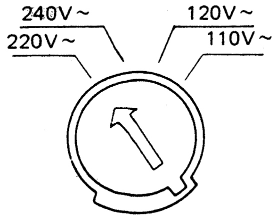
M2392

10. VOLTAGE CONVERSION

To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE. DO NOT DISASSEMBLE THE VOLTAGE SELECTOR ABSOLUTELY.





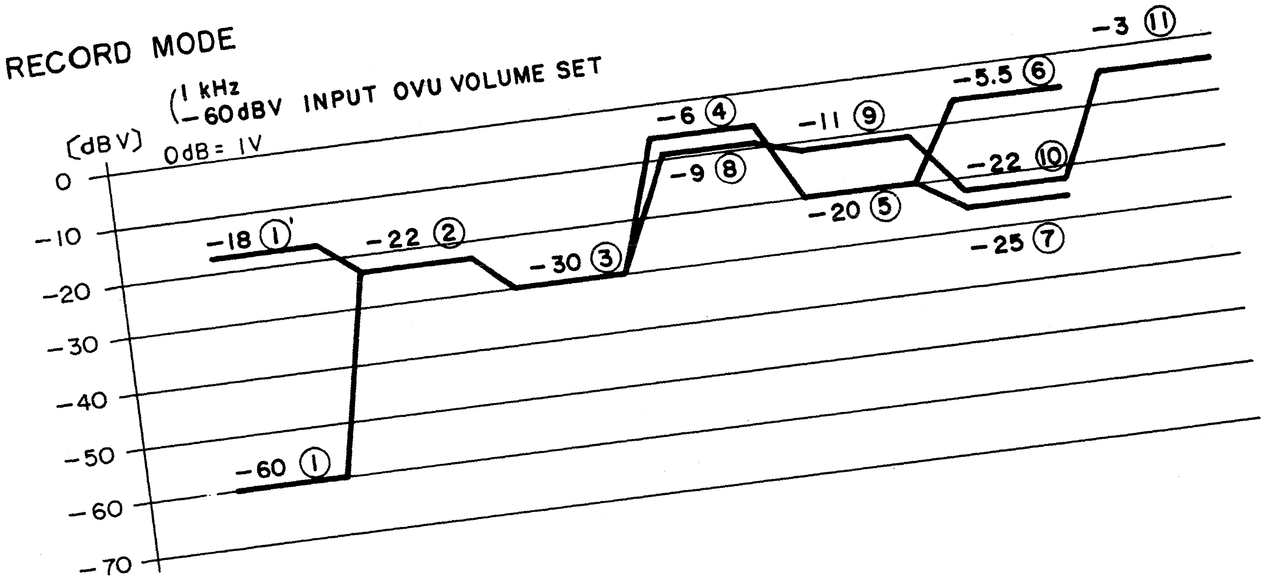
(N.T.A.P) VERSION

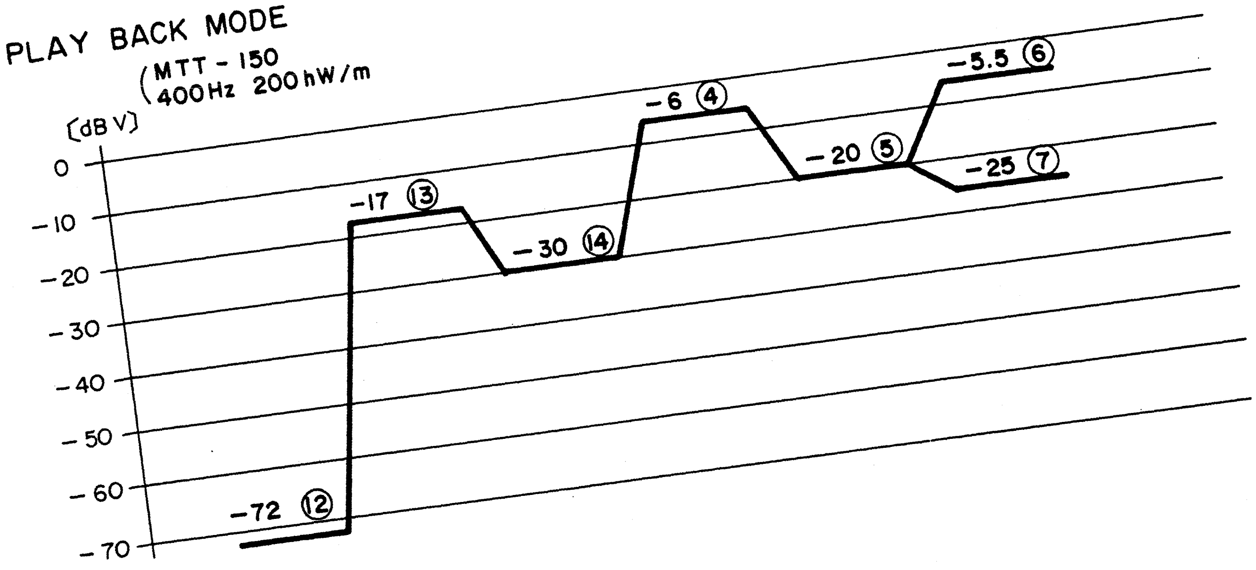
NOTE ON SAFETY:
SYMBOL ⚠ FIRE OR ELECTRICAL SHOCK HAZARD. ONLY ORIGINAL PARTS SHOULD BE USED TO REPLACE ANY PART MARKED WITH SYMBOL ⚠. ANY OTHER COMPONENT SUBSTITUTION (OTHER THAN ORIGINAL TYPE), MAY INCREASE RISK OF FIRE OR ELECTRICAL SHOCK HAZARD.

m2393

11. DIAGRAMS

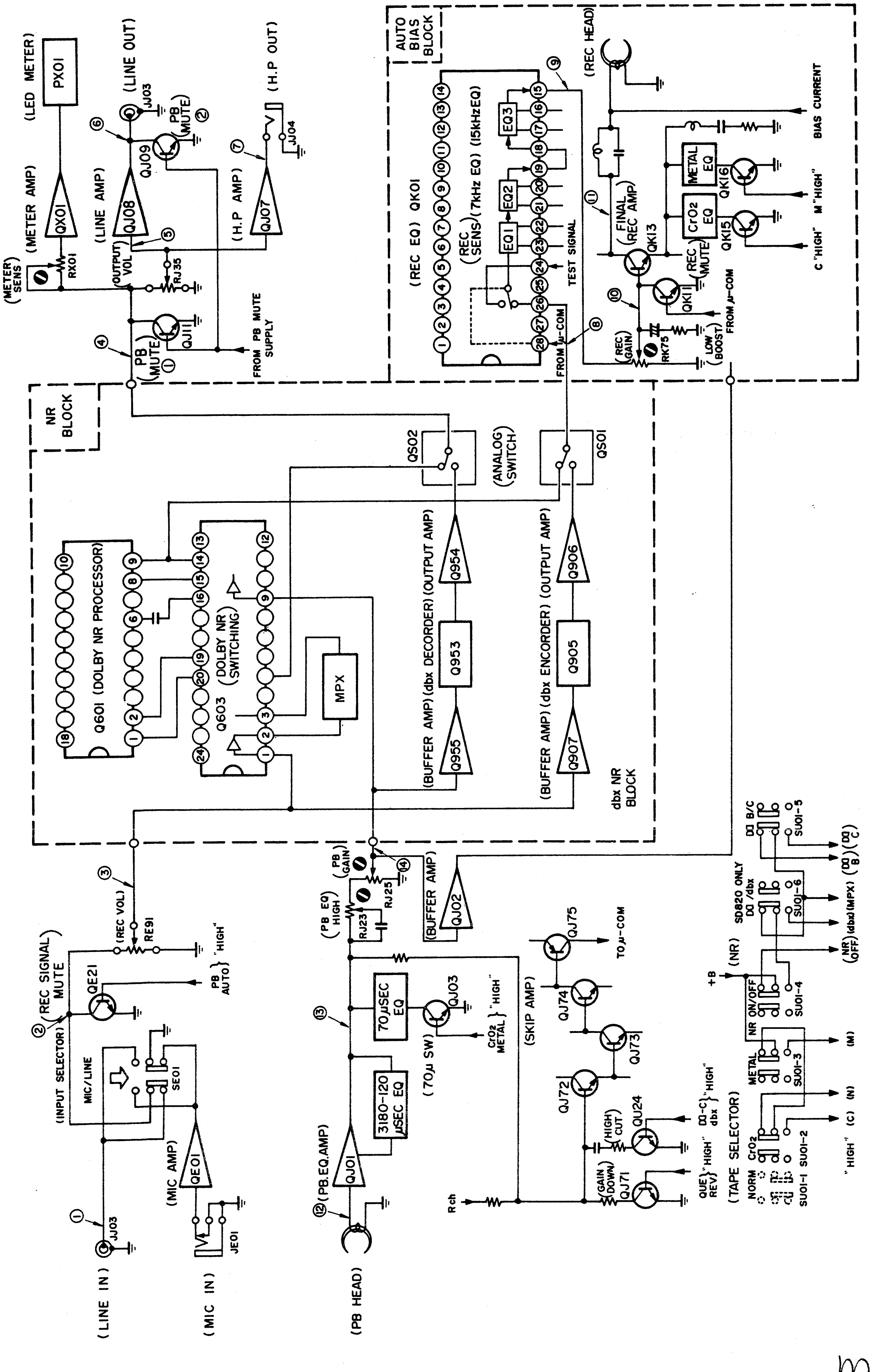
11.1 LEVEL DIAGRAM





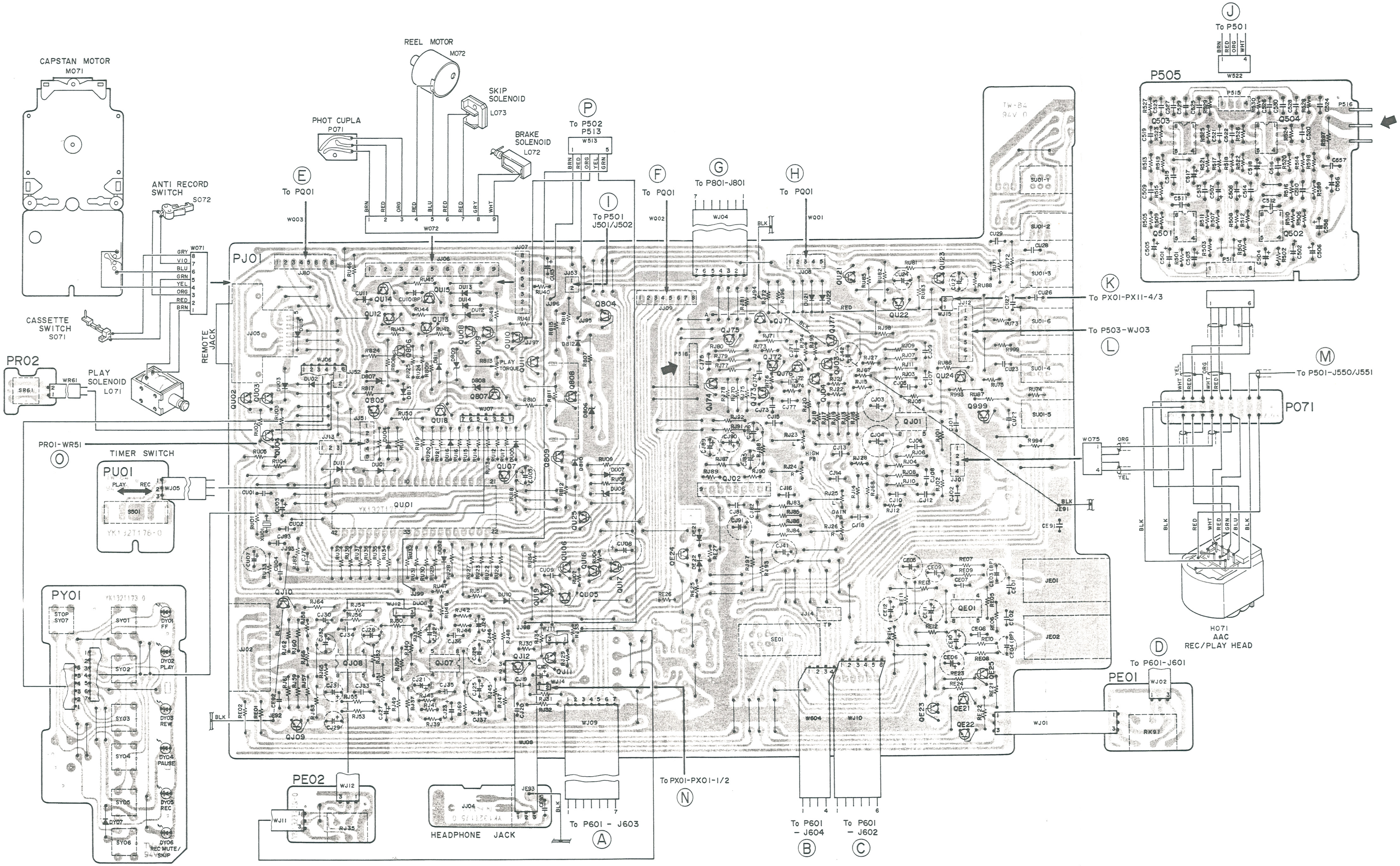
M2394

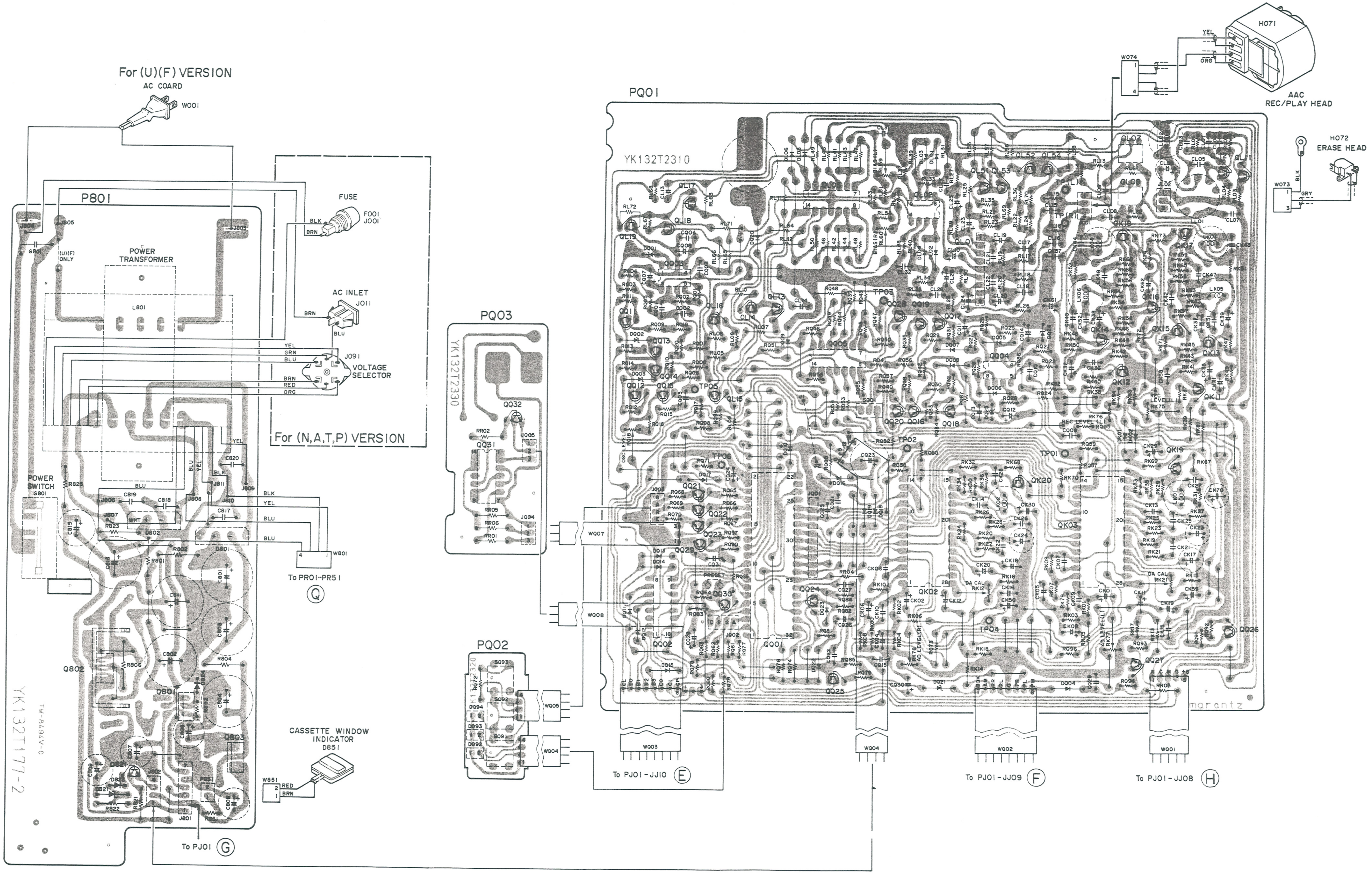
11.2 BLOCK DIAGRAM (AUDIO)

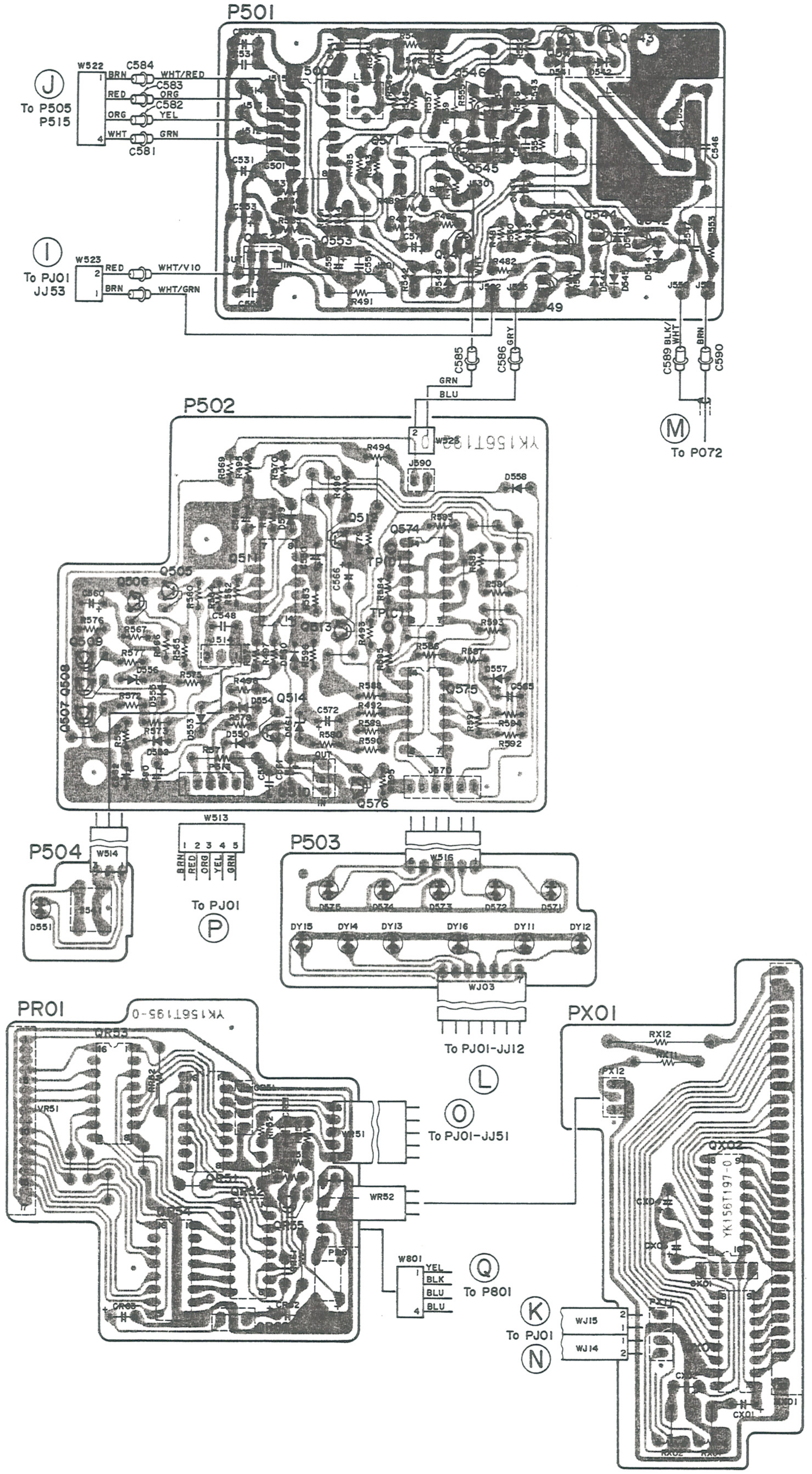

(LINE IN)
JJ03
(MIC IN)
JE01
(MIC AMP)
QE01
(INPUT SELECTOR)
MIC/LINE
SE01
(REC SIGNAL MUTE)
QE21
PB AUTO "HIGH"
(REC VOL)
RE91
(PB HEAD)
(PB.EQ.AMP)
QJ01
3180-120 μSEC EQ
70μSEC EQ
(70μ SW)
QJ03
CrO2 METAL "HIGH"
(PB EQ HIGH)
RJ23
(PB GAIN)
RJ25
(BUFFER AMP)
QJ02
(SKIP AMP)
QJ75
TO μ-COM
QJ74
QJ73
QJ72
(HIGH CUT)
QU24
(GAIN DOWN)
QJ71
QUE REV "HIGH"
DOLBY-C dbx "HIGH"
Rch
(TAPE SELECTOR)
NORM CrO2 METAL
SU01-1 SU01-2 SU01-3 SU01-4 SU01-5 SU01-6
"HIGH" (C) (N) (M)
+B
(NR)
NR ON/OFF
SD820 ONLY DOLBY /dbx
DOLBY B/C
(NR OFF) (dbx) (MPX) (DOLBY B) (DOLBY C)
NR BLOCK
Q601 (DOLBY NR PROCESSOR)
Q603 (DOLBY NR SWITCHING)
MPX
(BUFFER AMP) (dbx DECORDER) (OUTPUT AMP)
Q955
Q953
Q954
(BUFFER AMP) (dbx ENCORDER) (OUTPUT AMP)
Q907
Q905
Q906
dbx NR BLOCK
QS02
QS01
(ANALOG SWITCH)
(METER SENS)
RX01
(METER AMP)
QX01
PX01
(LED METER)
(OUTPUT VOL)
RJ35
(LINE AMP)
QJ08
QJ09
(PB MUTE)
JJ03
(LINE OUT)
(H.P AMP)
QJ07
JJ04
(H.P OUT)
QJ11
FROM PB MUTE SUPPLY
AUTO BIAS BLOCK
(REC EQ) QK01
(REC SENS/(7kHz EQ) (15kHzEQ)
EQ1
EQ2
EQ3
TEST SIGNAL
FROM μ-COM
(REC HEAD)
(FINAL REC AMP)
QK13
(REC MUTE)
QK11
FROM μ-COM
(REC GAIN)
RK75
(LOW BOOST)
CrO2 EQ
METAL EQ
QK15
QK16
C "HIGH"
M "HIGH"
BIAS CURRENT
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

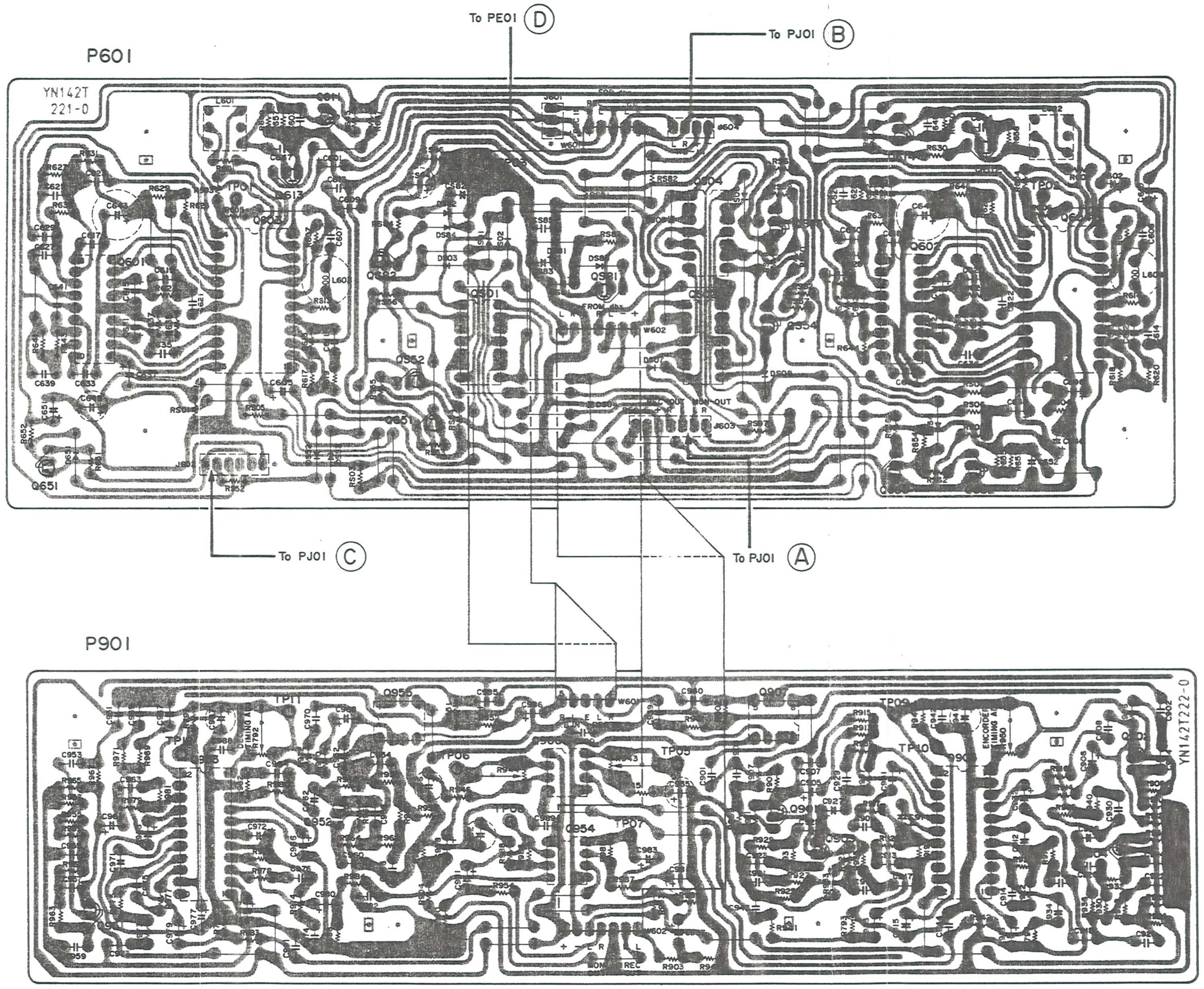
M2395

11.3 WIRING DIAGRAMS


CAPSTAN MOTOR
M071
REEL MOTOR
M072
SKIP SOLENOID
L073
BRAKE SOLENOID
L072
PHOT CUPLA
P071
ANTI RECORD SWITCH
S072
CASSETTE SWITCH
S071
PLAY SOLENOID
L071
PR02
SR61
WR61
W071
W072
W513
WQ03
WQ02
WQ01
WJ04
PJ01
REMOTE JACK
Ⓔ To PQ01
Ⓟ To P502 P513
Ⓘ To P501 J501/J502
Ⓕ To PQ01
Ⓖ To P801-J801
Ⓗ To PQ01
Ⓙ To P501
W522
P505
P515
P516
Q501
Q502
Q503
Q504
Ⓚ To PX01-PX11-4/3
Ⓛ To P503-WJ03
Ⓜ To P501-J550/J551
P071
W075
H071
AAC
REC/PLAY HEAD
Ⓓ To P601-J601
PE01
WJ02
RK91
WJ01
QU01
QJ01
QJ02
QE01
SE01
Ⓞ PR01-WR51
TIMER SWITCH
PU01
PLAY
REC
S501
WJ05
PY01
STOP
SY07
SY01
DY01 FF
SY02
DY02 PLAY
SY03
DY03 REW
SY04
DY04 PAUSE
SY05
DY05 REC
SY06
DY06 REC MUTE/SKIP
PE02
WJ12
WJ11
RJ35
HEADPHONE JACK
JJ04
WJ09
WJ08
Ⓐ To P601 - J603
Ⓝ To PX01-PX01-1/2
W604
WJ10
Ⓑ To P601 - J604
Ⓒ To P601 - J602
BRN
RED
ORG
YEL
GRN
BLU
VIO
GRY
WHT
BLK

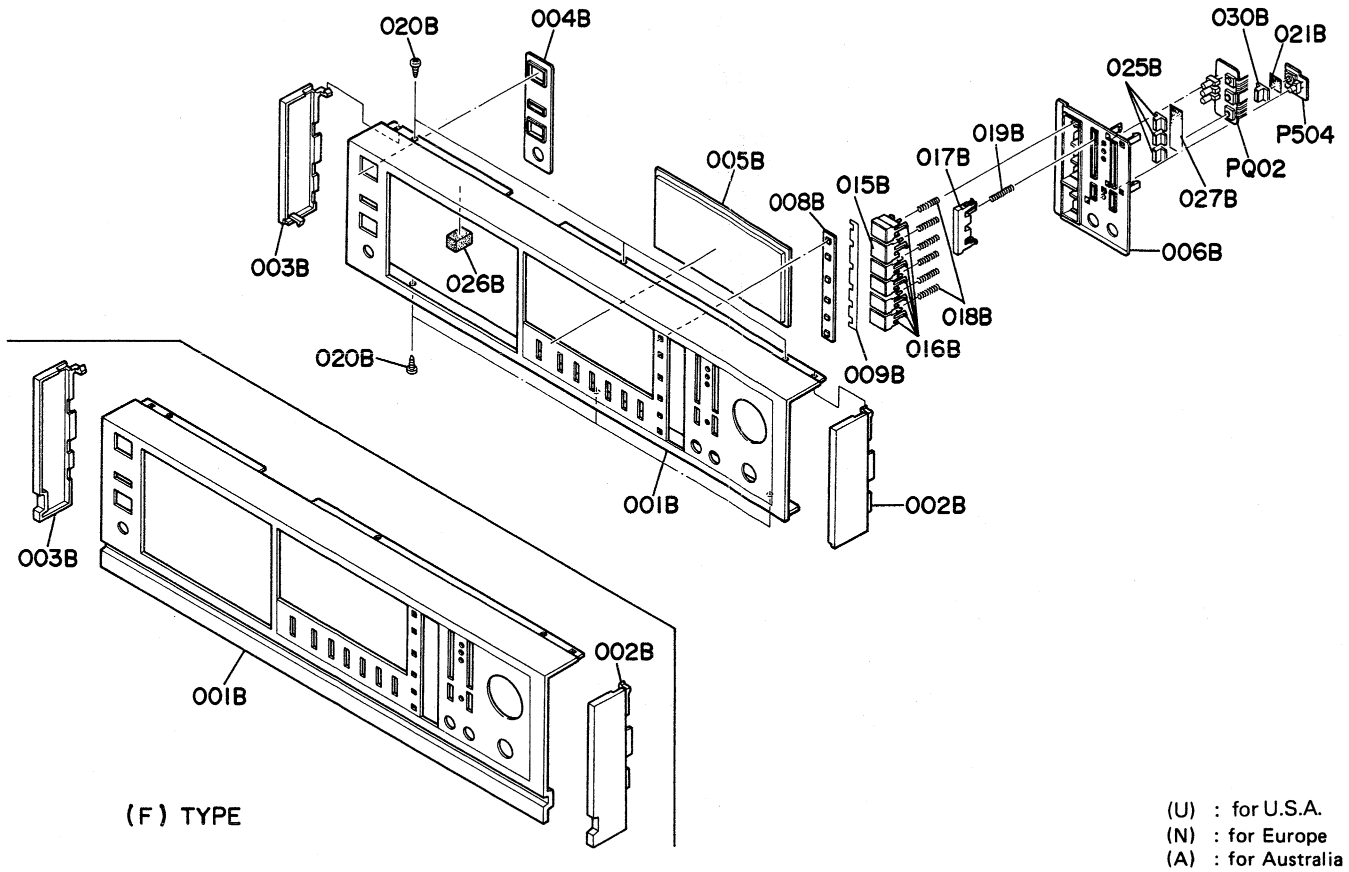

For (U)(F) VERSION
AC COARD
W001
P801
FUSE
F001
J001
BLK
BRN
J805
J803
G801
(U)(F) ONLY
POWER TRANSFORMER
L801
AC INLET
J011
BLU
YEL
GRN
BLU
J091
VOLTAGE SELECTOR
BRN
RED
ORG
For (N,A,T,P) VERSION
POWER SWITCH
S801
R825
C820
J811
J809
BLK
YEL
BLU
BLU
W801
To PR01-PR51
Q
Q802
YK132T1177-2
Q801
Q803
D851
CASSETTE WINDOW INDICATOR
W851
RED
BRN
To PJ01
G
PQ03
YK132T2330
QQ32
QQ31
WQ07
WQ08
PQ02
WQ05
WQ04
PQ01
YK132T2310
TP01
TP02
TP03
TP04
TP05
TP06
QQ01
QK02
QK03
WQ03
To PJ01-JJ10
E
WQ04
WQ02
To PJ01-JJ09
F
WQ01
To PJ01-JJ08
H
marantz
H071
YEL
ORG
W074
AAC REC/PLAY HEAD
H072
ERASE HEAD
W073
BLK
GRY


P501
J
To P505
P515
W522
C584
C583
C582
C581
BRN
WHT/RED
RED
ORG
YEL
WHT
GRN
I
To PJ01
JJ53
W523
RED
WHT/V10
BRN
WHT/GRN
C585
C586
GRN
BLU
GRY
C589
C590
BLK/WHT
BRN
M
To P072
P502
YK156T192-0
J590
Q505
Q506
Q507
Q508
Q513
Q514
Q574
Q575
Q576
TP01
P504
W514
D551
W513
BRN
RED
ORG
YEL
GRN
To PJ01
P
P503
W516
DY15
DY14
DY13
DY16
DY11
DY12
WJ03
To PJ01-JJ12
L
PR01
YK156T195-0
WR51
WR52
O
To PJ01-JJ51
W801
YEL
BLK
BLU
BLU
Q
To P801
K
To PJ01
N
WJ15
WJ14
PX01
RX12
PX12
QX02
YK156T197-0
CX01


To PE01
D
To PJ01
B
P601
YN142T
221-0
Q601
Q602
Q651
TP01
TP02
Q551
Q552
Q553
Q554
W601
W602
J601
J603
To PJ01
C
To PJ01
A
P901
YN142T222-0
TP06
TP07
TP08
TP09
TP10
TP11
Q952
Q954
Q955
Q956
W601
W602
MON
REC
ENCODER TIMING AD
TIMING AD

EXPLODED VIEWS AND PARTS LIST

[C01-99] FRONT PANEL

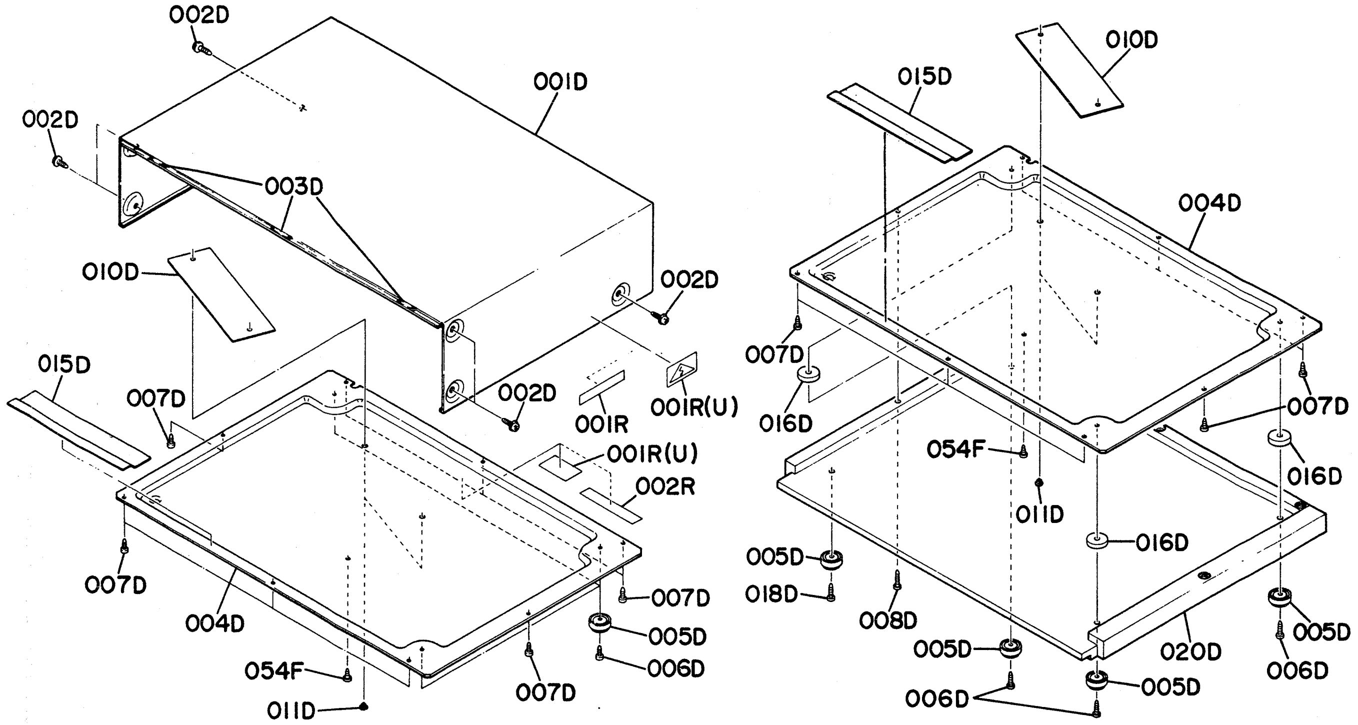

020B
004B
030B
021B
025B
P504
PQ02
027B
019B
017B
005B
015B
008B
006B
003B
026B
018B
016B
020B
009B
001B
002B
003B
002B
001B
(F) TYPE

(U) : for U.S.A.
(N) : for Europe
(A) : for Australia
(F) : for Japan

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
A	1	1	1		156T063400	Front Panel Assembly
A1				1	156T063410	Front Panel Assembly
001B	1	1	1		156T063010	Escutcheon, Front Panel (Gold)
001B				1	156T063110	Escutcheon, Front Panel (Black)
002B	1	1	1		229H067010	Cap, Right
002B				1	156T067110	Cap, Right
003B	1	1	1		229H067020	Cap, Left
003B				1	156T067120	Cap, Left
004B	1	1	1		128T259210	Bushing, Power & Eject
004B				1	128T259310	Bushing, Power & Eject
005B	1	1	1	1	156T158010	Window, Meter
006B	1	1	1		156T271010	Holder, Operation
006B				1	156T271110	Holder, Operation
008B	1	1	1	1	156T355010	Lens, LED
009B	1	1	1	1	128T122010	Sticker
015B	1	1	1		416H154220	Knob, Play Operation
015B				1	416H154420	Knob, Play Operation
016B	5	5	5		420H154210	Knob, Mecha Operation
016B				5	420H154330	Knob, Mecha Operation
017B	1	1	1		416H154230	Knob, Stop Operation
017B				1	416H154330	Knob, Stop Operation
018B	6	6	6	6	249H115010	Spring, Mecha Operation
019B	1	1	1	1	132T115010	Spring, Stop Operation

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
020B	6	6	6	6	51280306Z0	B.H. Tapped Screw B3 x 6
021B	1	1	1	1	156T056050	Buffer, A.A.C. Switch
025B	3	3	3		132T154110	Knob, Auto Bias (Gold)
025B				3	132T154310	Knob, Auto Bias (Black)
026B	1	1	1	1	128T114010	Stopper
027B	1	1	1	1	132T056010	Buffer
030B	1	1	1		128T154310	Knob, Mic Switch (Gold)
030B				1	128T154110	Knob, Mic Switch (Black)

[C02-99] LID (TOP & BOTTOM COVER)

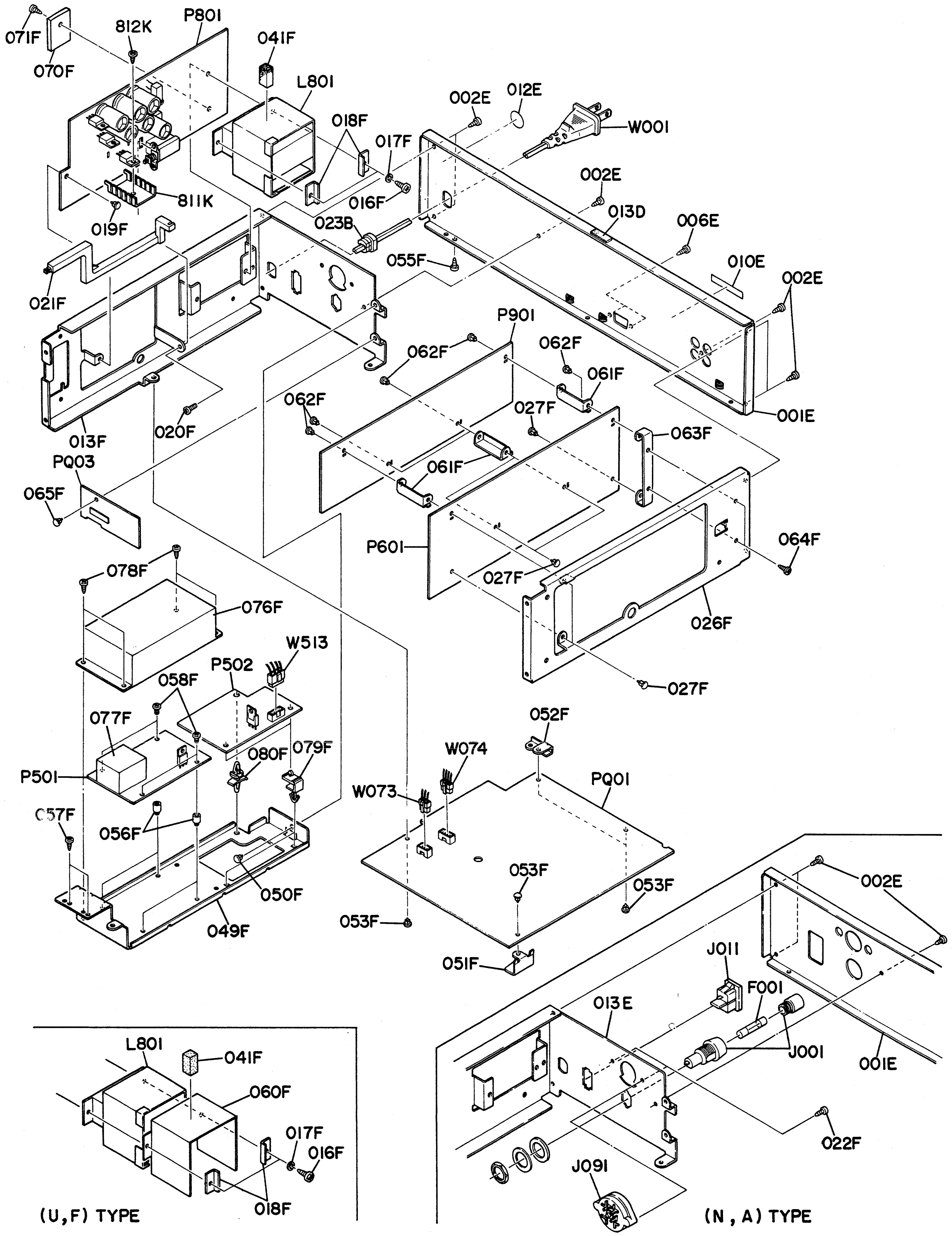

002D
001D
002D
003D
010D
002D
015D
007D
002D
001R
001R(U)
001R(U)
002R
007D
004D
005D
006D
054F
011D
007D
010D
015D
004D
007D
016D
007D
054F
016D
011D
016D
005D
018D
008D
005D
006D
020D
005D
005D
006D

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
001D	1	1	1		128T257330	Lid, Top Cover (Gold)
001D				1	128T257320	Lid, Top Cover (Gray)
002D	6	6	6	6	51260408Z0	B.T. Screw B4 x 8
003D	3	3	3	3	201H118010	Spacer
004D	1	1	1	1	128T257010	Lid, Bottom Cover
005D	3	3	3	4	416H057010	Leg
006D	3	3	3		51280408B0	B.H. Tapped Screw B4 x 8
006D				3	51280430U0	B.H. Tapped Screw B4 x 30
007D	8	8	8	7	51280308B0	B.H. Tapped Screw B3 x 8
008D				1	51280320B0	B.H. Tapped Screw B3 x 20

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
010D	1	1	1	1	136T109010	Shield
011D	2	2	2	2	2276005050	Clamper
015D	1	1	1	1	156T303030	Mask
016D				3	416H057010	Leg
018D				1	51524113A0	R. H. Wood Screw
020D				1	156T004010	Table
001R	2				117H861010	Label
001R		1	1		2911861140	Label
002R		1	1		2911861110	Label
054F	1	1	1	1	51100308A9	B.H.M. Screw B3 x 8

M2399

[C03-99] REAR PANEL

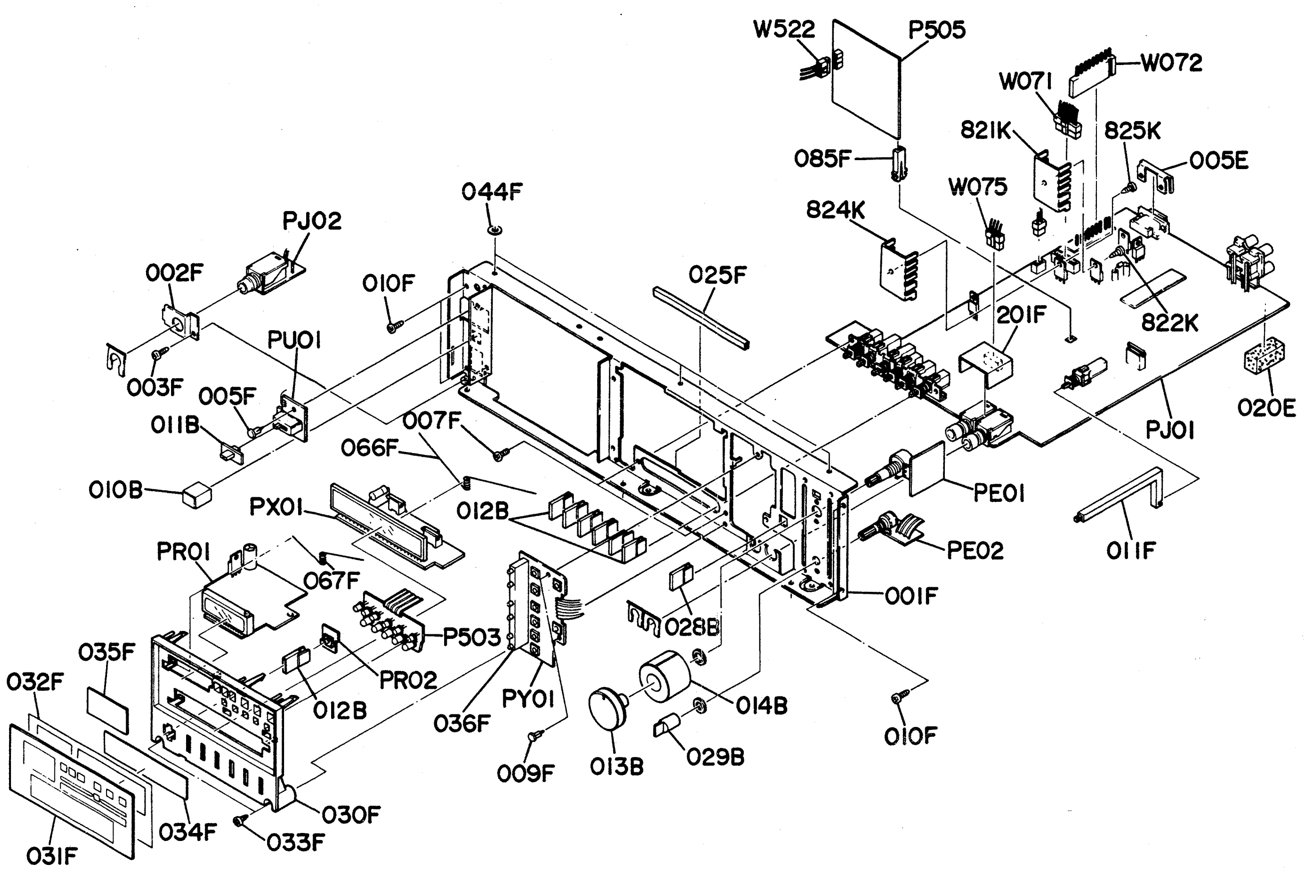

071F
070F
812K
P801
041F
L801
002E
012E
W001
018F
017F
016F
002E
013D
006E
811K
019F
023B
021F
055F
010E
002E
P901
062F
062F
061F
001E
013F
020F
062F
027F
063F
PQ03
065F
061F
P601
064F
078F
027F
076F
026F
W513
P502
058F
027F
077F
052F
W074
079F
P501
080F
W073
PQ01
057F
056F
053F
053F
050F
002E
049F
053F
051F
J011
013E
F001
L801
041F
J001
060F
001E
017F
016F
022F
J091
018F
(U,F) TYPE
(N, A) TYPE

M2400

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
023B	1			1	1455259030	Bushing, AC Cord
013D	1	1	1	1	201H118010	Spacer
001E	1				156T160230	Bracket, Rear Panel
001E		1	1		156T160210	Bracket, Rear Panel
001E				1	156T160220	Bracket, Rear Panel
002E	6	6	6		51280308B0	B.H. Tapped Screw B3 x 8
002E				6	51280308Z0	B.H. Tapped Screw B3 x 8
006E	2	2	2		51282610B0	B.H. Tapped Screw B2.6 x 10
006E				2	51282610U0	B.H. Tapped Screw B2.6 x 10
010E	1			1	2112265010	Indicator, Serial No.
010E		1	1		2112265110	Indicator, Serail No.
012E	1				2457861040	Label, CSA
013F	1	1	1	1	128T160560	Bracket, K; Power Supply
016F	2	2	2	2	51280412B0	B.H. Tapped Screw B4 x 12
017F	2	2	2	2	54040402N0	Spring Washer
018F	2	2	2	2	4265005010	Clamper, Transformer
019F	1	1	1	1	2276005050	Clamper
020F	1	1	1	1	51100306Z9	B.H.M. Screw B3 x 6
021F	1	1	1	1	128T121010	Link, Power Switch
022F		2	2		51280308B0	B.H. Tapped Screw B3 x 8
026F	1	1	1	1	128T160130	Bracket, Side Chassis
027F	5	5	5	5	2276005050	Clamper, Dolby PWB
041F	1	1	1	1	3435056040	Buffer, Transformer
049F	1	1	1	1	156T126020	Stay, A.A.C. PWB
050F	1	1	1	1	2276005050	Clamper
051F	1	1	1	1	132T160010	Bracket, Auto Bias PWB
052F	1	1	1	1	132T160020	Bracket, Auto Bias PWB
053F	4	4	4	4	2276005050	Clamper
055F	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6
056F	4	4	4	4	156T101010	Support
057F	2	2	2	2	51280305B0	B.H. Tapped Screw B3 x 5
058F	4	4	4	4	51100305A9	B.H.M. Screw B3 x 5
060F	1			1	128T109020	Shield
061F	4	4	4	4	142T160010	Bracket
062F	5	5	5	5	2276005050	Clamper
063F	1	1	1	1	142T160020	Bracket
064F	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
065F	1	1	1	1	2276005050	Clamper
070F	1	1	1	1	142T120010	Insulator
071F	1	1	1	1	2276005050	Clamper
076F	1	1	1	1	156T109020	Shield
077F	1	1	1	1	156T109030	Shield
078F	4	4	4	4	51280305B0	B.H. Tapped Screw B3 x 5
079F	2	2	2	2	156T153010	Hinge
080F	1	1	1	1	156T101020	Support
811K	1	1	1	1	202H267030	Heatsink
812K	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
⚠F001		1	1		FS10031800	Fuse, T315mA
⚠J001		1	1		YJ08000290	Jack, Fuse Holder
⚠J011		1	1		YP04000580	Plug, AC Inlet
⚠J091		1	1		BY05080050	Voltage Selector
⚠L801	1				TS15715110	Power Transformer
⚠L801		1	1		TS15716070	Power Transformer
⚠L801				1	TS15715100	Power Transformer
⚠W001	1				YC01900070	A.C. Power Cord
⚠W001				1	YC01800190	A.C. Power Cord
W073	1	1	1	1	YB00201030	Connective Cord, (3P)
W074	1	1	1	1	YB00201100	Connective Cord, (4P)
W513	1	1	1	1	YB00250230	Connective Cord, (6P)

[P01-99] FRONT CHASSIS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W072
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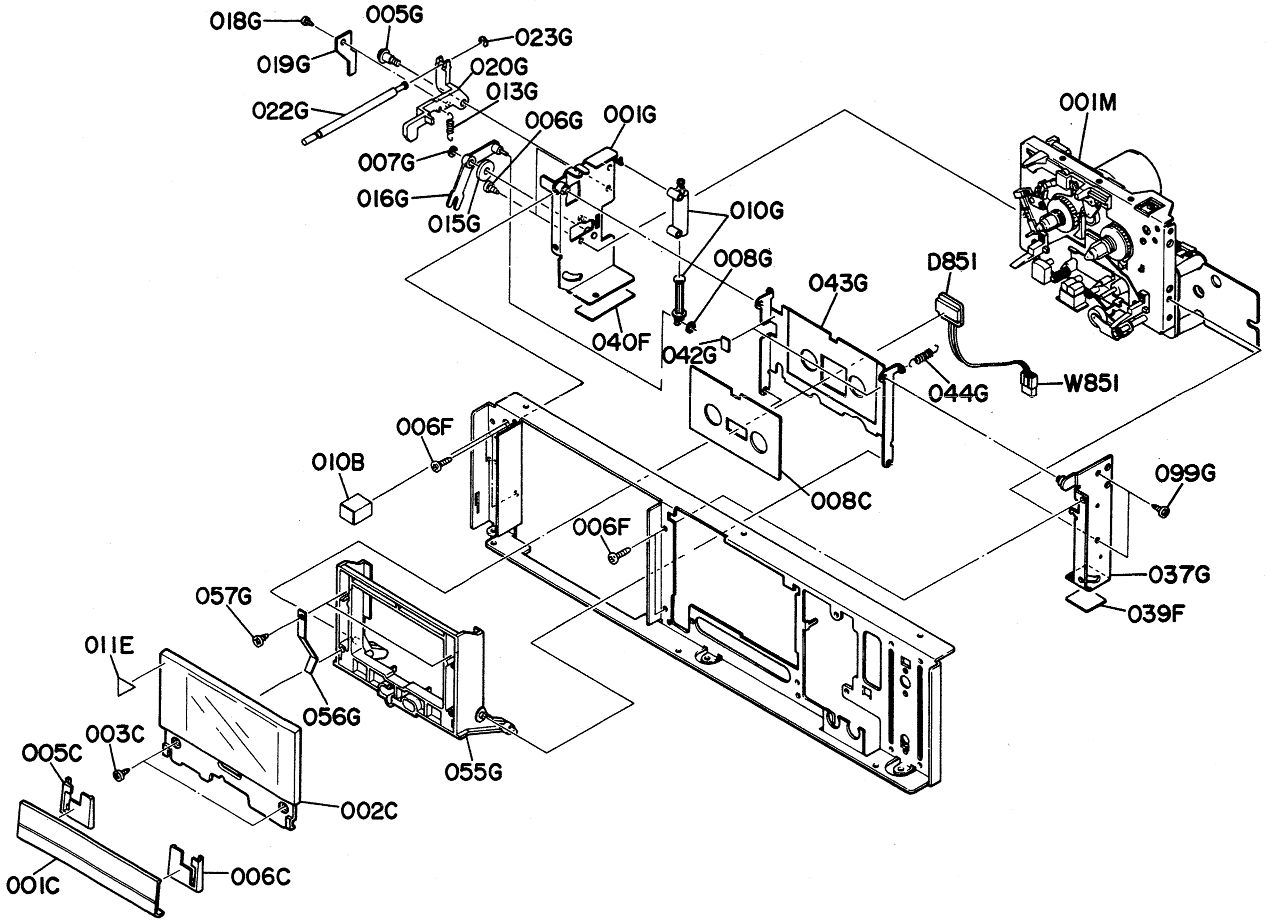
PU01
201F
822K
003F
005F
011B
007F
066F
020E
PJ01
010B
PX01
012B
PE01
PR01
067F
PE02
011F
001F
028B
P503
035F
PR02
032F
012B
PY01
014B
036F
010F
009F
013B
029B
034F
030F
031F
033F

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
010B	1	1	1		415H154210	Knob, Power (Gold)
010B				1	415H154310	Knob, Power (Black)
011B	1	1	1		128T154320	Knob, Timer (Gold)
011B				1	128T154120	Knob, Timer (Black)
012B	7	7	7		128T154310	Knob, Push Sw. (Gold)
012B				7	128T154110	Knob, Push Sw. (Black)
013B	1	1	1		156T154010	Knob, Rec; Left (Gold)
013B				1	156T154110	Knob, Rec; Left (Black)
014B	1	1	1		156T154020	Knob, Rec; Right (Gold)
014B				1	156T154120	Knob, Rec; Right (Black)
028B	1	1	1		132T154110	Knob, A.A.C. (Gold)
028B				1	132T154410	Knob, A.A.C. (Black)
029B	1	1	1		132T154030	Knob, Output Level (Gold)
029B				1	132T154130	Knob, Output Level (Black)
005E	1	1	1	1	132T160040	Bracket, Remote Jack
020E	1	1	1	1	103H056020	Buffer
001F	1	1	1	1	156T160010	Bracket, Front Chassis
002F	1	1	1	1	128T160080	Bracket, Phones Jack
003F	1	1	1	1	51300306B0	P.H. Tapped Screw P3 x 6
005F	1	1	1	1	2276005050	Clamper
007F	2	2	2	2	51100306A9	B.H.M. Screw B3 x 6
009F	2	2	2	2	2276005050	Clamper
010F	4	4	4	4	51280306Z0	B.H. Tapped Screw B3 x 6
011F	1	1	1	1	128T121020	Link, Input Select
025F	1	1	1	1	156T259010	Bushing

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
030F	1	1	1		156T271020	Holder, Meter
030F				1	156T271120	Holder, Meter
031F	1	1	1		156T265010	Indicator, Meter
031F				1	156T265110	Indicator, Meter
032F	1	1	1	1	156T122010	Sticker
033F	2	2	2	2	51280308B0	B.H. Tapped Screw B3 x 8
034F	1	1	1	1	156T303010	Mask, FL Meter
035F	1	1	1	1	156T303020	Mask, Counter
036F	1	1	1	1	128T271040	Holder, L.E.D.
044F	3	3	3	3	2258118010	Spacer
066F	1	1	1	1	156T115010	Spring, FL
067F	1	1	1	1	156T115020	Spring, Counter
085F	1	1	1	1	156T101030	Support
201F	1	1	1	1	128T109010	Shield, Mic Jack
821K	1	1	1	1	202H267030	Heatsink
822K	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6
824K	1	1	1	1	415H267010	Heatsink
825K	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6
W071	1	1	1	1	YB00420070	Connective Cord, (8P)
W072	1	1	1	1	YJ06001070	Jack, (9P)
W075	1	1	1	1	YB00250160	Connective Cord, (4P)
W522	1	1	1	1	YB00201050	Connective Cord, (4P)

[P02-99] ASSOCIATED MECHANISM FOR CASSETTE TAPE OPERATION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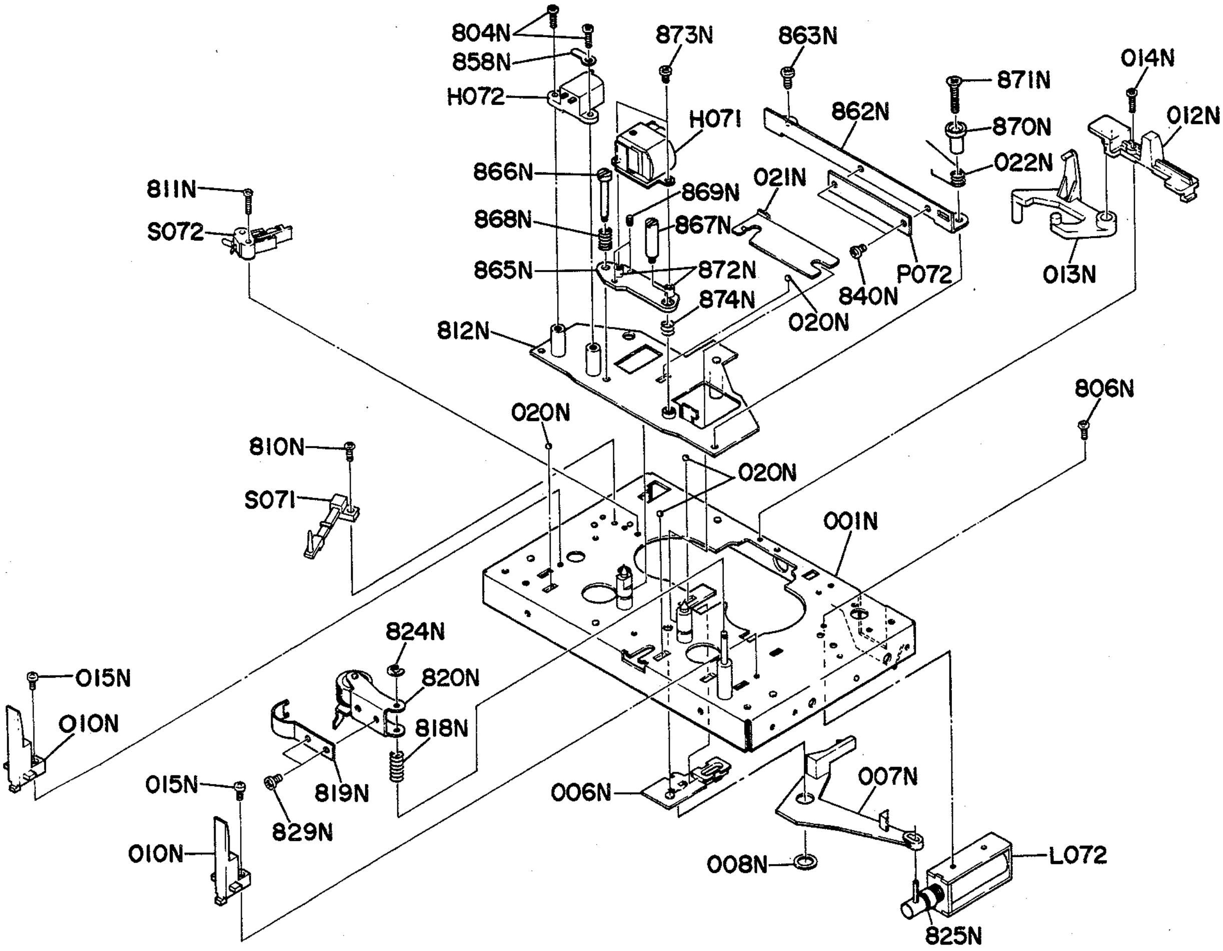
006F
037G
057G
039F
011E
056G
003C
005C
055G
002C
001C
006C

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
010B	1	1	1		415H154210	Knob, Eject (Gold)
010B				1	415H154310	Knob, Eject (Black)
001C	1	1	1		156T063020	Escutcheon,Cassette Lid(Gold)
001C				1	156T063120	Escutcheon,Cassette Lid(Black)
002C	1	1	1		156T158020	Window
002C				1	156T158120	Window
003C	2	2	2	2	51280308B0	B.H. Tapped Screw B3 x 8
005C	1	1	1		156T067030	Cap, Left (Gold)
005C				1	156T067130	Cap, Left (Black)
006C	1	1	1		156T067040	Cap, Right (Gold)
006C				1	156T067140	Cap, Right (Black)
008C	1	1	1		156T274010	Reflector, Cassette (Gold)
008C				1	156T274110	Reflector, Cassette (Black)
011E	1				113T861010	Label, 2 Year
006F	4	4	4	4	51280306Z0	P.H. Tapped Screw P3 x 6
039F	1	1	1	1	201H118010	Spacer
040F	1	1	1	1	201H118010	Spacer
001G	1	1	1	1	128T160540	Bracket, K; Left
005G	1	1	1	1	4367112150	Shaft, Eject Arm
006G	2	2	2	2	51280306Z0	B.H. Tapped Screw B3 x 6
007G	1	1	1	1	307Y114020	Stopper
008G	1	1	1	1	64020200Q0	RG Ring, CS Type

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
010G	1	1	1	1	128T276010	Piston, Dumper
013G	1	1	1	1	4367115240	Spring
015G	1	1	1	1	156T056010	Buffer
016G	1	1	1	1	128T121030	Link
018G	1	1	1	1	51302605B0	P.H. Tapped Screw P2.6 x 5
019G	1	1	1	1	132T354010	Lever, Interlock
020G	1	1	1	1	128T002040	Arm, Eject
022G	1	1	1	1	128T254020	Pin, Eject
023G	1	1	1	1	128T114020	Stopper, Pin
037G	1	1	1	1	156T160500	Bracket, K; Right
042G	2	2	2	2	307Y056020	Buffer, Cassette
043G	1	1	1	1	128T104020	Retainer, Cassette Door
044G	1	1	1	1	128T115080	Spring, Door Open
055G	1	1	1	1	128T271050	Holder, Cassette
056G	2	2	2	2	128T115010	Spring
057G	2	2	2	2	51282605B0	B.H. Tapped Screw B2.6 x 5
099G	2	2	2	2	51280306Z0	B.H. Tapped Screw B3 x 6
001M	1	1	1	1	317Y304010	Mechanism Assembly
D851	1	1	1	1	HI10029320	L.E.D. LT-9300E
W851	1	1	1	1	YB00220110	Connective Cord, (2P)

M2401

[P03-99] PARTS ASSEMBLED ON TOP OF CHASSIS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S072
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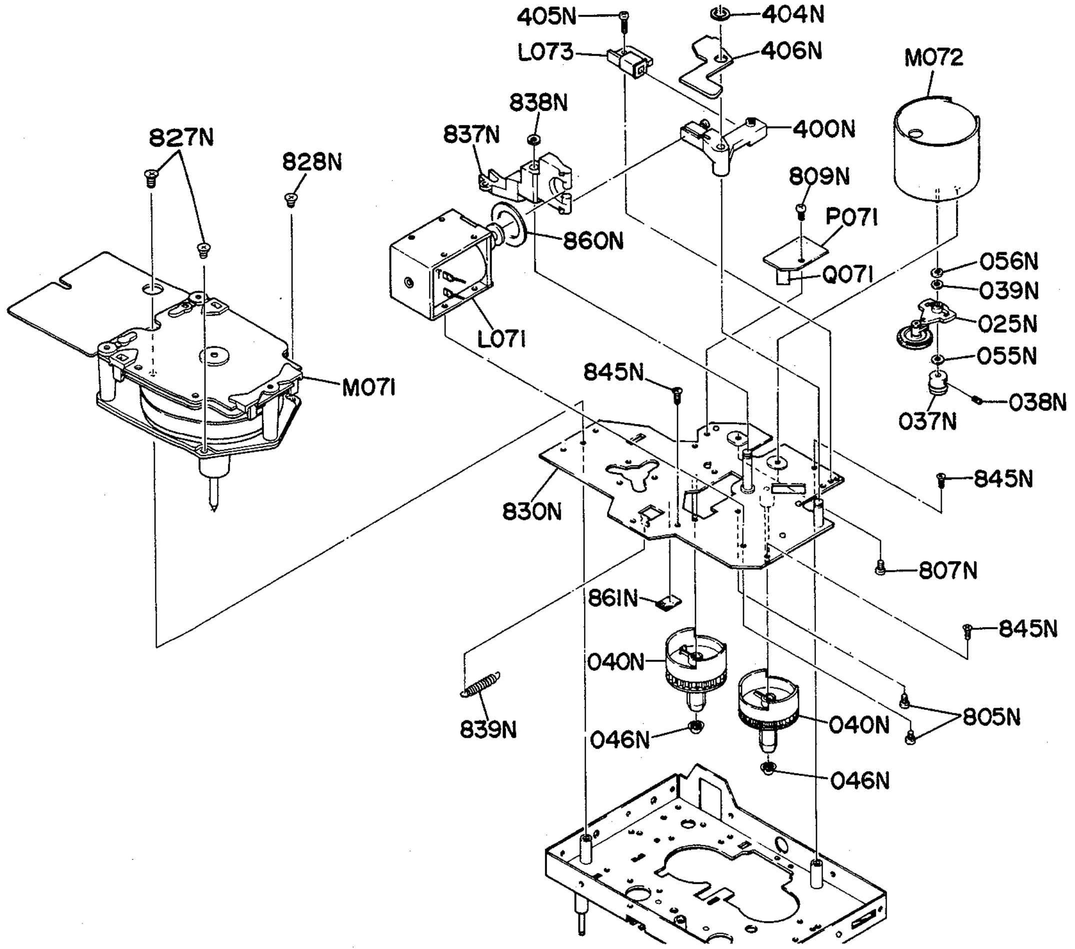
020N
810N
020N
S071
001N
824N
015N
820N
010N
818N
007N
015N
819N
006N
829N
010N
L072
008N
825N

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
001N	1	317Y105410	Chassis Assembly
006N	1	313Y160010	Bracket, Brake Arm
007N	1	313Y002030	Arm, Brake
008N	1	59050802G9	Washer
010N	2	313Y104020	Retainer, Guide
012N	1	313Y104030	Retainer, Guide
013N	1	313Y002050	Arm, Rec Safty
014N	1	51062608A0	P.H.M. Screw P2.6 x 8
015N	2	51062606A0	P.H.M. Screw P2.6 x 6
020N	4	61025010T0	Ball
021N	1	313Y115010	Spring, Head Chassis
022N	1	317Y115030	Spring, Pinch Roller
804N	2	51100206A0	B.H.M. Screw B2 x 6
806N	1	51442604A0	L. Washer Screw L2.6 x 4
810N	1	51062604A0	P.H.M. Screw P2.6 x 4
811N	1	51100208A0	B.H.M. Screw B2 x 8
812N	1	317Y105400	Chassis Assembly, Head
818N	1	317Y115040	Spring, Pinch Arm
819N	1	317Y051010	Guide, Tape
820N	1	317Y002410	Arm Assembly, Pinch Roller
824N	1	64002500R0	RG Ring, E Type
825N	1	313Y115060	Spring, Brake Solenoid
829N	2	51572604A0	P. Taptite Screw P2.6 x 4
840N	2	51100203A0	B.H.M. Screw B2 x 8
858N	1	62021030W0	Lug

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
862N	1	317Y271010	Holder, Head
863N	1	51102603A0	B.H.M. Screw B2.6 x 3
865N	1	317Y104010	Retainer, Head
866N	1	317Y101010	Support, Azimuth
867N	1	317Y101020	Support, Azimuth
868N	1	317Y115060	Spring, Azimuth
869N	2	51690206Q0	Socket Screw, HP M2 x 6
870N	1	317Y055010	Collar
871N	1	51042612A0	F.H.M. Screw F2.6 x 12
872N	2	317Y055020	Collar, R/P Head
873N	2	51100205A0	B.H.M. Screw B2 x 5
874N	1	317Y115050	Spring
H071	1	LH83381010	Rec/Play Head
H072	1	LH31000580	Erase Head
⚠L072	1	ME10440010	Solenoid Coil, Brake
S071	1	SM01010740	Mini Switch, Cassette
S072	1	SM01010950	Mini Switch, Rec Safty
P072	1	YK156T1990	P.W. Board, Head Lead Connect
	1	ZZ156T1990	P.W. Board Assembly
W075	1	YB00250160	Connective Cord, (4P)

m2402

[P04-99] PARTS ASSEMBLED ON REVERSE OF CHASSIS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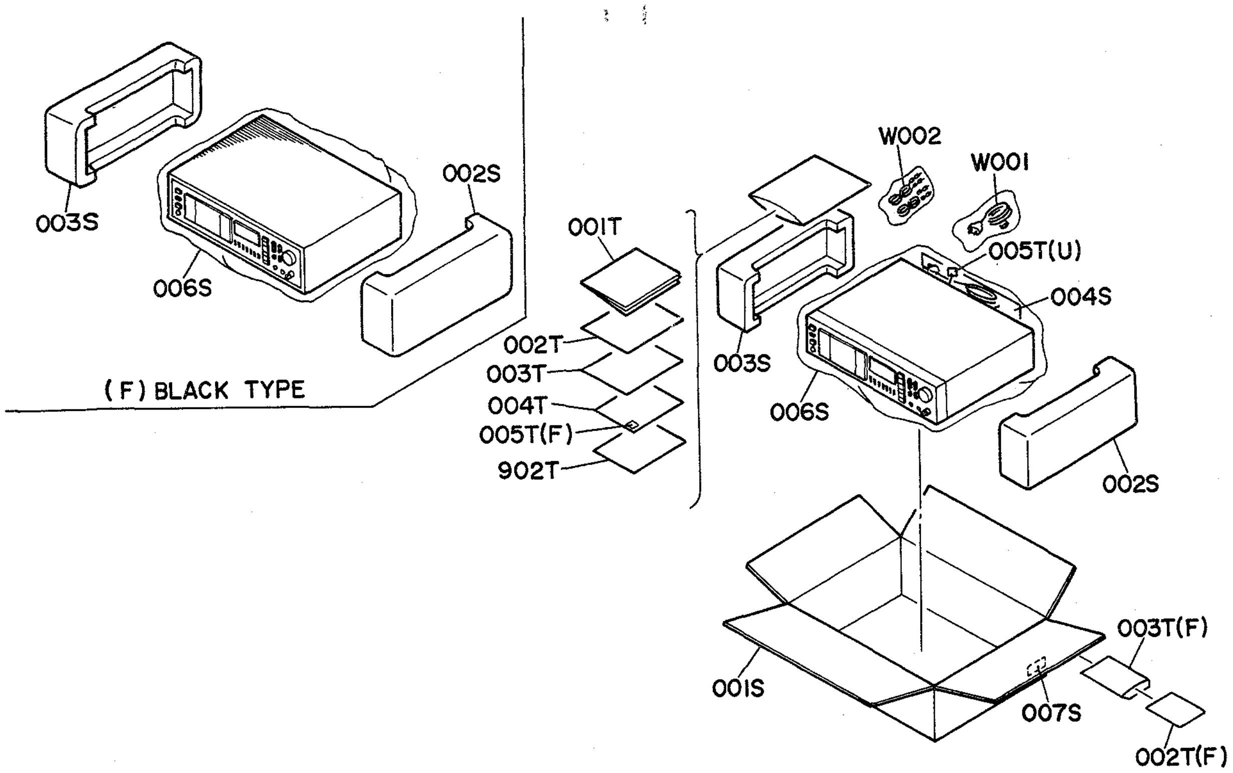
037N
845N
830N
807N
861N
845N
040N
839N
805N
046N
040N
046N

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
025N	1	313Y002530	Arm Assembly, F/R
037N	1	313Y262050	Pulley
038N	1	51692603Q0	Socket Screw, HP M2.6 x 3
039N	2	59020405G9	Washer
040N	2	313Y004510	Table, Reel
046N	2	4367067010	Cap, Reel
055N	1	59020805G9	Washer
056N	1	313Y118010	Spacer
400N	1	313Y002720	Arm Assembly, Skip
404N	1	307Y114020	Stopper
405N	1	51060206A0	P.H.M. Screw P2 x 6
406N	1	313Y002100	Arm, Interlock
805N	2	51060304A9	P.H.M. Screw P3 x 4
807N	2	51062603A0	P.H.M. Screw P2.6 x 3
809N	1	51572604A0	P. Taptite Screw P2.6 x 4
827N	2	51042606A0	F.H.M. Screw F2.6 x 6
828N	1	51042604A0	F.H.M. Screw F2.6 x 4
830N	1	317Y105720	Chassis Assembly, Sub
837N	1	313Y002040	Arm, Play
838N	1	307Y114020	Stopper

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
839N	1	313Y115050	Spring
845N	3	51042606A0	F.H.M. Screw F2.6 x 6
860N	1	313Y118030	Spacer
861N	1	313Y118040	Spacer
⚠L071	1	ME10490020	Solenoid Coil, Play
⚠L073	1	ME00140030	Solenoid Coil. Skip
⚠M071	1	MM11500020	D.C. Motor, DD
⚠M072	1	MM00900010	D.C. Motor, F/R
P071	1	YH313Y0210	P.W. Board, Sensor
	1	ZZ313Y0210	P.W. Board Assembly
Q071	1	HW10001030	Photo Unit

M2403

[H01-99] PACKING MATERIALS



REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
001S	1				156T801020	Packing Case
001S		1	1		156T801010	Packing Case
001S				1	156T801110	Packing Case
002S	1	1	1		229H809010	Cushion, Right
002S				1	156T809010	Cushion, Right
003S	1	1	1		229H809020	Cushion, Left
003S				1	156T809010	Cushion, Left
004S	1			1	2918107370	Sheet
006S	1	1	1	1	9090808030	Polyethylene Sheet
007S	4				9526019020	Serial No. Card
007S		4			9526019060	Serial No. Card
007S			4		9526019030	Serial No. Card
007S				4	9526019040	Serial No. Card
001T	1				156T851210	User Manual
001T		1	1		156T851310	User Manual
001T				1	156T851110	User Manual
002T	1				156T851210	User Manual, Spec
002T		1	1		156T851320	User Manual, Spec
002T				1	9631000130	Warrantee Card
003T	1				103H854010	Warrantee Card
003T		1			156T856010	Circuit Diagram
003T			1		9631000090	Warrantee Card
003T				1	128T854010	Warrantee Card

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
004T	1				2225813010	Envelope
004T				1	9611000050	User's Card
005T	1				9560000100	Hang Tag
005T				1	9540000010	License
902T	1				9650000050	S. Station Card
⚠W001		1			ZC01805010	A.C. Power Cord
⚠W001			1		ZC01604010	A.C. Power Cord
W002	2	2	2	2	ZD01000230	Connective Cord

m2404

(U) : for U.S.A.
(N) : for Europe
(A) : for Australia
(F) : for Japan

ELECTRICAL PARTS LIST

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
						P501-A.A. CONTROL CIRCUIT BOARD
P501	1	1	1	1	YK156T1910	P.W. Board, A.A. Control
	1	1	1		ZZ156T1910	P.W. Board Assembly
						P501-CAPACITORS
C531	1	1	1	1	EA10701030	Elect 100µF 10V
C532	1	1	1	1	DK18223310	Ceramic 0.022µF
C533	1	1	1	1	EA10601630	Elect 10µF 16V
C534	1	1	1	1	DK18223310	Ceramic 0.022µF
C541	1	1	1	1	EA10405030	Elect 0.1µF 50V
C542	1	1	1	1	DF15103350	Film 0.01µF ±5%
C543	1	1	1	1	DF15104350	Film 0.1µF ±5%
C544	1	1	1	1	EA47701630	Elect 470µF 16V
C546	1	1	1	1	DF16684510	Film 0.68µF ±10%
C547	1	1	1	1	DF16103540	Film 0.01µF ±10%
C552	1	1	1	1	DK18223310	Ceramic 0.022µF
C553	1	1	1	1	EA47701630	Elect 470µF 16V
C554	1	1	1	1	DK18223310	Ceramic 0.022µF
C555	1	1	1	1	EA47601030	Elect 47µF 10V
C571	1	1	1	1	EA10601630	Elect 10µF 16V
C581	1	1	1	1	DC18222010	Feedthru 2200pF
C582	1	1	1	1	DC18222010	Feedthru 2200pF
C583	1	1	1	1	DC18222010	Feedthru 2200pF
C584	1	1	1	1	DC18222010	Feedthru 2200pF
C585	1	1	1	1	DC18222010	Feedthru 2200pF
C586	1	1	1	1	DC18222010	Feedthru 2200pF
C587	1	1	1	1	DC18222010	Feedthru 2200pF
C588	1	1	1	1	DC18222010	Feedthru 2200pF
C589	1	1	1	1	DC18222010	Feedthru 2200pF
C590	1	1	1	1	DC18222010	Feedthru 2200pF
						P501-RESISTORS (All Resistors are ±5% & ¼W)
R481	1	1	1	1	GD05102140	1KΩ
R482	1	1	1	1	GD05103140	10KΩ
R483	1	1	1	1	GD05472140	4.7KΩ
R485	1	1	1	1	GD05104140	100KΩ
R487	1	1	1	1	GD05273140	27KΩ
R488	1	1	1	1	GD05104140	100KΩ
R489	1	1	1	1	GD05104140	100KΩ
R490	1	1	1	1	GD05104140	100KΩ
R491	1	1	1	1	RF05100120	10Ω ½W, Fusible
R500	9	9	9	9	GD05000140	0Ω
R535	1	1	1	1	GD05102140	1KΩ
R536	1	1	1	1	GD05394140	390KΩ
R537	1	1	1	1	GD05222140	2.2KΩ
R541	1	1	1	1	GD05332140	3.3KΩ
R542	1	1	1	1	GD05473140	47KΩ
R543	1	1	1	1	GD05332140	3.3KΩ
R544	1	1	1	1	GD05103140	10KΩ
R545	1	1	1	1	GD05222140	2.2KΩ
R546	1	1	1	1	GD05472140	4.7KΩ
R547	1	1	1	1	GD05682140	6.8KΩ
R548	1	1	1	1	GD05472140	4.7KΩ
R549	1	1	1	1	GD05472140	4.7KΩ
R550	1	1	1	1	GD05472140	4.7KΩ
R551	1	1	1	1	GD05472140	4.7KΩ
R552	1	1	1	1	GD05332140	3.3KΩ
R553	1	1	1	1	GD05103140	10KΩ
R554	1	1	1	1	GD05471140	470Ω
R555	1	1	1	1	GD05333140	33KΩ
R556	1	1	1	1	GD05333140	33KΩ
R557	1	1	1	1	GD05822140	8.2KΩ
R558	1	1	1	1	GD05822140	8.2KΩ
R559	1	1	1	1	NK05330120	33Ω ½W
G501	1	1	1	1	BW05472010	4.7KΩ 1/8W, Compo.
						P501-SEMICONDUCTORS
D501	1	1	1	1	HV00001540	Varistor BZW06-128B
D541	1	1	1	1	HD20020010	Diode 1SS82
D542	1	1	1	1	HD20020010	Diode 1SS82
D543	1	1	1	1	HD20020010	Diode 1SS82
D544	1	1	1	1	HD20020010	Diode 1SS82
D545	1	1	1	1	HD20020010	Diode 1SS82
D546	1	1	1	1	HD20020010	Diode 1SS82
D567	1	1	1	1	HD20001210	Diode 1S2473C
D548	1	1	1	1	HD20001210	Diode 1S2473C
D549	1	1	1	1	HD20001210	Diode 1S2473C
Q500	1	1	1	1	HC10001520	IC AZ1MC0-3
Q541	1	1	1	1	HT110911B0	Transistor 2SA1091(O)
Q542	1	1	1	1	HT110911B9	Transistor 2SA1091 (O)
Q543	1	1	1	1	HT325511B0	Transistor 2SC2551(O)
Q544	1	1	1	1	HT325511B0	Transistor 2SC2551(O)
Q545	1	1	1	1	HT411111A0	Transistor 2SD1111
Q546	1	1	1	1	HT411111A0	Transistor 2SD1111
Q547	1	1	1	1	HT313832A0	Transistor 2SC1383(R, Q)
Q548	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q549	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q552	1	1	1	1	HC38512090	IC NJM78M12A
Q553	1	1	1	1	HC38105090	IC NJM78L05A
Q571	1	1	1	1	HC10040020	IC AN6558
						P501-MISCELLANEOUS
L541	1	1	1	1	LO70033220	OSC Coil, 3.3MHz
L542	1	1	1	1	TO12413040	Output Transformer
W521	1	1	1	1	YB00150390	Connective Cord, (2P)
W522	1	1	1	1	YB00201050	Connective Cord, (4P)
W523	1	1	1	1	YB00150400	Connective Cord, (2P)
						P502-PHASE MOTOR CIRCUIT BOARD
P502	1	1	1	1	YK156T1920	P.W. Board, Phase Motor
	1	1	1		ZZ156T1920	P.W. Board Assembly
						P502-CAPACITORS
C535	1	1	1	1	DK18223310	Ceramic 0.022µF
C548	1	1	1	1	DF15103350	Film 0.01µF ±5%
C549	1	1	1	1	EA22601630	Elect 22µF 16V
C550	1	1	1	1	EA10601630	Elect 10µF 16V
C560	1	1	1	1	EA47601630	Elect 47µF 16V
C561	1	1	1	1	EA47601630	Elect 47µF 16V
C562	1	1	1	1	EA47601630	Elect 47µF 16V
C565	1	1	1	1	EA10601630	Elect 10µF 16V
C566	1	1	1	1	EA22701030	Elect 22µF 10V
C572	1	1	1	1	EA22601630	Elect 47µF 16V
C580	1	1	1	1	EA10601630	Elect 10µF 16V

M2405

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
						P502-RESISTORS
						(All Resistors are ±5% & ¼W)
R492	1	1	1	1	GD05221140	220Ω
R493	1	1	1	1	GD05221140	220Ω
R494	1	1	1	1	RA01020800	1KΩ(B), Trimming
R495	1	1	1	1	GD05222140	2.2KΩ
R496	1	1	1	1	GD05103140	10KΩ
R497	1	1	1	1	GD05103140	10KΩ
R498	1	1	1	1	GD05103140	10KΩ
R500	10	10	10	10	GD05000140	0Ω
R560	1	1	1	1	GD05182140	1.8KΩ
R561	1	1	1	1	GD05104140	100KΩ
R562	1	1	1	1	GD05333140	33KΩ
R563	1	1	1	1	GD05223140	22KΩ
R564	1	1	1	1	GD05103140	10KΩ
R565	1	1	1	1	GD05103140	10KΩ
R566	1	1	1	1	GD05103140	10KΩ
R567	1	1	1	1	GD05103140	10KΩ
R568	1	1	1	1	GD05682140	6.8KΩ
R569	1	1	1	1	GD05333140	33KΩ
R570	1	1	1	1	GD05473140	47KΩ
R571	1	1	1	1	RF05100120	10Ω ½W, Fusible
R572	1	1	1	1	GD05103140	10KΩ
R573	1	1	1	1	GD05103140	10KΩ
R574	1	1	1	1	GD05103140	10KΩ
R575	1	1	1	1	GD05103140	10KΩ
R576	1	1	1	1	GD05272140	2.7KΩ
R577	1	1	1	1	GD05103140	10KΩ
R578	1	1	1	1	GD05562140	5.6KΩ
R579	1	1	1	1	GD05333140	33KΩ
R580	1	1	1	1	GD05153140	15KΩ
R581	1	1	1	1	GD05563140	56KΩ
R582	1	1	1	1	GD05182140	1.8KΩ
R583	1	1	1	1	GD05272140	2.7KΩ
R584	1	1	1	1	GD05823140	82KΩ
R585	1	1	1	1	GD05272140	2.7KΩ
R586	1	1	1	1	GD05272140	2.7KΩ
R587	1	1	1	1	GD05473140	47KΩ
R588	1	1	1	1	GD05103140	10KΩ
R589	1	1	1	1	GD05223140	22KΩ
R590	1	1	1	1	GD05103140	10KΩ
R591	1	1	1	1	GD05223140	22KΩ
R592	1	1	1	1	GD05103140	10KΩ
R593	1	1	1	1	GD05223140	22KΩ
R594	1	1	1	1	GD05103140	10KΩ
R595	1	1	1	1	GD05102140	1KΩ
R596	1	1	1	1	GD05333140	33KΩ
						P502-SEMICONDUCTORS
D550	1	1	1	1	HD20001210	Diode 1S2473C
D552	1	1	1	1	HD20001210	Diode 1S2473C
D553	1	1	1	1	HD20001210	Diode 1S2473C
D554	1	1	1	1	HD20001210	Diode 1S2473C
D555	1	1	1	1	HD20001210	Diode 1S2473C
D556	1	1	1	1	HD30004020	Zener MA1051M
D557	1	1	1	1	HD20001210	Diode 1S2473C
D558	1	1	1	1	HD20001210	Diode 1S2473C
D559	1	1	1	1	HD20001210	Diode 1S2473C
D560	1	1	1	1	HD20001210	Diode 1S2473C
D561	1	1	1	1	HD30007020	Zener MA1091M

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
Q505	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q506	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q507	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q508	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q509	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q510	1	1	1	1	HC38512090	IC NJM78M12A
Q511	1	1	1	1	HC401300B0	IC 4013B
Q512	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q513	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q514	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q574	1	1	1	1	HC10135030	IC LA6324
Q575	1	1	1	1	HC10135030	IC LA6324
Q576	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
						P502-MISCELLANEOUS
J514	1	1	1	1	YJ06002430	Jack, (3P)
J570	1	1	1	1	YJ06002450	Jack, (6P)
J590	1	1	1	1	YP06002370	Plug, (2P)
P513	1	1	1	1	YP06002420	Plug, (6P)
						P503-LED INDICATOR CIRCUIT BOARD
P503	1	1	1	1	YK156T1930	P.W. Board, LED Indicator
	1	1	1		ZZ156T1930	P.W. Board Assembly
						P503-SEMICONDUCTORS
D571	1	1	1	1	HI10024320	L.E.D. GL-5HY10
D572	1	1	1	1	HI10024320	L.E.D. GL-5HY10
D573	1	1	1	1	HI10022320	L.E.D. GL-5NG10
D574	1	1	1	1	HI10024320	L.E.D. GL-5HY10
D575	1	1	1	1	HI10024320	L.E.D. GL-5HY10
DY11	1	1	1	1	HI10055020	L.E.D. LN840CP
DY12	1	1	1	1	HI10055020	L.E.D. LN840CP
DY13	1	1	1	1	HI10054020	L.E.D. LN340CP
DY14	1	1	1	1	HI10054020	L.E.D. LN340CP
DY15	1	1	1	1	HI10054020	L.E.D. LN340CP
DY16	1	1	1	1	HI10055020	L.E.D. LN840CP
						P503-MISCELLANEOUS
W516	1	1	1	1	YU06260260	Jumper Lead, (6P)
WY03	1	1	1	1	YU07120260	Jumper Lead, (7P)
						P504-A.A. CONTROL SW. CIRCUIT BOARD
P504	1	1	1	1	YK156T1940	P.W. Board, A.A. Control SW.
	1	1	1		ZZ156T1940	P.W. Board Assembly
D551	1	1	1	1	HI10049020	LED LN422YP
S541	1	1	1	1	SP01010580	Push Switch, A.A.C. ON/OFF
W514	1	1	1	1	YU03500260	Jumper Lead, (3P)

m2406

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
						P505-A.A.C. 4ch EQ AMP. CIRCUIT BOARD
P505	1	1	1	1	YK156T1980	P.W. Board, A.C.C. 4ch EQ Amp
	1	1	1		ZZ156T1980	P.W. Board Assembly
						P505-CAPACITORS
C501	1	1	1	1	EA22505030	Elect 2.2μF 50V
C502	1	1	1	1	EA22505030	Elect 2.2μF 50V
C503	1	1	1	1	EA22505030	Elect 2.2μF 50V
C504	1	1	1	1	EA22505030	Elect 2.2μF 50V
C505	1	1	1	1	EA33405030	Elect 0.33μF 50V
C506	1	1	1	1	EA33405030	Elect 0.33μF 50V
C507	1	1	1	1	EA33405030	Elect 0.33μF 50V
C508	1	1	1	1	EA33405030	Elect 0.33μF 50V
C509	1	1	1	1	DF15104350	Film 0.1μF ±5%
C510	1	1	1	1	DF15104350	Film 0.1μF ±5%
C511	1	1	1	1	DF15104350	Film 0.1μF ±5%
C512	1	1	1	1	DF15104350	Film 0.1μF ±5%
C513	1	1	1	1	DF15104350	Film 0.1μF ±5%
C514	1	1	1	1	DF15014350	Film 0.1μF ±5%
C515	1	1	1	1	DD15101370	Ceramic 100pF ±5%
C516	1	1	1	1	DD15101370	Ceramic 100pF ±5%
C517	1	1	1	1	EA22505030	Elect 2.2μF 50V
C518	1	1	1	1	EA22505030	Elect 2.2μF 50V
C519	1	1	1	1	DD15101370	Ceramic 100pF ±5%
C520	1	1	1	1	DD15101370	Ceramic 100pF ±5%
C521	1	1	1	1	DD15101370	Ceramic 100pF ±5%
C522	1	1	1	1	DD15101370	Ceramic 100pF ±5%
C523	1	1	1	1	DK16681300	Ceramic 680pF ±10%
C524	1	1	1	1	DK16681300	Ceramic 680pF ±10%
C525	1	1	1	1	DK16681300	Ceramic 680pF ±10%
C526	1	1	1	1	DK16681300	Ceramic 680pF ±10%
C527	1	1	1	1	DF15104350	Film 0.1μF ±5%
C528	1	1	1	1	DF15104350	Film 0.1μF ±5%
C529	1	1	1	1	DF15104350	Film 0.1μF ±5%
C530	1	1	1	1	DF15104350	Film 0.1μF ±5%
C556	1	1	1	1	EA10701630	Elect 100μF 16V
C557	1	1	1	1	DK18223310	Ceramic 0.022μF
C558	1	1	1	1	EA47601030	Elect 47μF 10V
						P505-RESISTORS (All Resistors are ±5% & ¼W)
R500	6	6	6	6	GD05000140	0Ω
R501	1	1	1	1	GD05154140	150KΩ
R502	1	1	1	1	GD05154140	150KΩ
R503	1	1	1	1	GD05154140	150KΩ
R504	1	1	1	1	GD05154140	150KΩ
R505	1	1	1	1	GD05471140	470Ω
R506	1	1	1	1	GD05471140	470Ω
R507	1	1	1	1	GD05471140	470Ω
R508	1	1	1	1	GD05471140	470Ω
R509	1	1	1	1	GD05154140	150KΩ
R510	1	1	1	1	GD05154140	150KΩ

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
R511	1	1	1	1	GD05154140	150KΩ
R512	1	1	1	1	GD05154140	150KΩ
R513	1	1	1	1	GD05103140	10KΩ
R514	1	1	1	1	GD05103140	10KΩ
R515	1	1	1	1	GD05103140	10KΩ
R516	1	1	1	1	GD05103140	10KΩ
R517	1	1	1	1	GD05103140	10KΩ
R518	1	1	1	1	GD05103140	10KΩ
R519	1	1	1	1	GD05224140	220KΩ
R520	1	1	1	1	GD05224140	220KΩ
R521	1	1	1	1	GD05224140	220KΩ
R522	1	1	1	1	GD05224140	220KΩ
R523	1	1	1	1	GD05224140	220KΩ
R524	1	1	1	1	GD05224140	220KΩ
R525	1	1	1	1	GD05224140	220KΩ
R526	1	1	1	1	GD05224140	220KΩ
R527	1	1	1	1	GD05102140	1KΩ
R528	1	1	1	1	GD05102140	1KΩ
R529	1	1	1	1	GD05102140	1KΩ
R530	1	1	1	1	GD05102140	1KΩ
R597	1	1	1	1	RF05101120	100Ω ½W, Fusible
R598	1	1	1	1	GD05103140	10KΩ
R599	1	1	1	1	GD05103140	10KΩ
						P505-SEMICONDUCTORS
Q501	1	1	1	1	HC10017090	IC NJM2043D-D
Q502	1	1	1	1	HC10017090	IC NJM2043D-D
Q503	1	1	1	1	HC10003090	IC NJM4558D
Q504	1	1	1	1	HC10003090	IC NJM4558D
						P505-MISCELLANEOUS
P511	1	1	1	1	YP06002420	Plug, (6P)
P515	1	1	1	1	YP06002400	Plug, (4P)
P516	1	1	1	1	YP06000330	Plug, (3P)
						P601-DOLBY B-C NR CIRCUIT BOARD
P601	1	1	1	1	YN142T2210	P.W. Board, Dolby B-C NR
	1	1	1		ZZ142T2210	P.W. Board Assembly
						P601-CAPACITORS
CS81	1	1	1	1	EA10602530	Elect 10μF 25V
CS82	1	1	1	1	EA10602530	Elect 10μF 25V
CS83	1	1	1	1	EA47601030	Elect 47μF 10V
CS84	1	1	1	1	EA47601030	Elect 47μF 10V
CS85	1	1	1	1	DK18103300	Ceramic 0.01μF
CS86	1	1	1	1	DK18103300	Ceramic 0.01μF
C601	1	1	1	1	EA10505030	Elect 1μF 50V
C602	1	1	1	1	EA10505030	Elect 1μF 50V
C603	1	1	1	1	DF15332300	Film 3300pF ±5%
C604	1	1	1	1	DF15332300	Film 3300pF ±5%
C605	1	1	1	1	EA10602530	Elect 10μF 25V
C606	1	1	1	1	EA10602530	Elect 10μF 35V
C607	1	1	1	1	DF15182300	Film 1800pF ±5%
C608	1	1	1	1	DF15182300	Film 1800pF ±5%
C609	1	1	1	1	EA10505030	Elect 1μF 50V
C610	1	1	1	1	EA10505030	Elect 1μF 50V
C611	1	1	1	1	DF15103350	Film 0.01μF ±5%
C612	1	1	1	1	DF15103350	Film 0.01μF ±5%
C613	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C614	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C615	1	1	1	1	EA10602530	Elect 10μF 25V

M2407

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
C616	1	1	1	1	EA10602530	Elect 10μF 25V
C617	1	1	1	1	DF15473350	Film 0.047μF ±5%
C618	1	1	1	1	DF15473350	Film 0.047μF ±5%
C619	1	1	1	1	DF15472300	Film 4700pF ±5%
C620	1	1	1	1	DF15472300	Film 4700pF ±5%
C621	1	1	1	1	DF15333350	Film 0.033μF ±5%
C622	1	1	1	1	DF15333350	Film 0.033μF ±5%
C623	1	1	1	1	DF15683350	Film 0.068μF ±5%
C624	1	1	1	1	DF15683350	Film 0.068μF ±5%
C625	1	1	1	1	DF15333350	Film 0.033μF ±5%
C626	1	1	1	1	DF15333350	Film 0.033μF ±5%
C627	1	1	1	1	DF15104350	Film 0.1μF ±5%
C628	1	1	1	1	DF15104350	Film 0.1μF ±5%
C629	1	1	1	1	DF15154350	Film 0.15μF ±5%
C630	1	1	1	1	DF15154350	Film 0.15μF ±5%
C631	1	1	1	1	EA10602530	Elect 10μF 25V
C632	1	1	1	1	EA10602530	Elect 10μF 25V
C633	1	1	1	1	DF15224350	Film 0.22μF ±5%
C634	1	1	1	1	DF15224350	Film 0.22μF ±5%
C635	1	1	1	1	DF15472300	Film 4700pF ±5%
C636	1	1	1	1	DF15472300	Film 4700pF ±5%
C637	1	1	1	1	EA10602530	Elect 10μF 25V
C638	1	1	1	1	EA10602530	Elect 10μF 25V
C639	1	1	1	1	DF15333350	Film 0.033μF ±5%
C640	1	1	1	1	DF15333350	Film 0.033μF ±5%
C641	1	1	1	1	DF15104350	Film 0.1μF ±5%
C642	1	1	1	1	DF15104350	Film 0.1μF ±5%
C643	1	1	1	1	EA47701630	Elect 470μF 16V
C644	1	1	1	1	EA47701630	Elect 470μF 16V
C645	1	1	1	1	EA22602530	Elect 22μF 25V
C646	1	1	1	1	EA22602530	Elect 22μF 25V
C647	1	1	1	1	DF15272300	Film 2700pF ±5%
C648	1	1	1	1	DF15272300	Film 2700pF ±5%
C651	1	1	1	1	EA10602530	Elect 10μF 25V
C652	1	1	1	1	EA10505030	Elect 1μF 50V
						P601-RESISTORS **(All Resistors are ±5% & ¼W)**
RS01	1	1	1	1	GD05563140	56KΩ
RS02	1	1	1	1	GD05563140	56KΩ
RS03	1	1	1	1	GD05563140	56KΩ
RS04	1	1	1	1	GD05563140	56KΩ
RS05	1	1	1	1	GD05272140	2.7KΩ
RS06	1	1	1	1	GD05272140	2.7KΩ
RS07	1	1	1	1	GD05122140	1.2KΩ
RS08	1	1	1	1	GD05122140	1.2KΩ
RS52	1	1	1	1	GD05823140	82KΩ
RS53	1	1	1	1	GD05823140	82KΩ
RS54	1	1	1	1	GD05823140	82KΩ
RS55	1	1	1	1	GD05154140	150KΩ
RS56	1	1	1	1	GD05823140	82KΩ
RS57	1	1	1	1	GD05823140	82KΩ
RS58	1	1	1	1	GD05823140	82KΩ
RS59	1	1	1	1	GD05823140	82KΩ
RS60	1	1	1	1	GD05154140	150KΩ
RS61	1	1	1	1	GD05823140	82KΩ
RS62	1	1	1	1	GD05823140	82KΩ
RS63	1	1	1	1	GD05103140	10KΩ
RS81	1	1	1	1	NF02100140	10Ω, Fuse
RS82	1	1	1	1	NF02100140	10Ω, Fuse
RS83	1	1	1	1	GD05271140	270Ω
RS84	1	1	1	1	GD05271140	270Ω

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
R601	1	1	1	1	GD05242140	2.4KΩ
R602	1	1	1	1	GD05242140	2.4KΩ
R603	1	1	1	1	GD05562140	5.6KΩ
R604	1	1	1	1	GD05562140	5.6KΩ
R605	1	1	1	1	GD05562140	12KΩ
R606	1	1	1	1	GD05123140	12KΩ
R607	1	1	1	1	GD05472140	4.7KΩ
R608	1	1	1	1	GD05472140	4.7KΩ
R613	1	1	1	1	GD05102140	1KΩ
R614	1	1	1	1	GD05102140	1KΩ
R615	1	1	1	1	GD05683140	68KΩ
R616	1	1	1	1	GD05683140	68KΩ
R617	1	1	1	1	GD05222140	2.2KΩ
R618	1	1	1	1	GD05222140	2.2KΩ
R619	1	1	1	1	GD05512140	5.1KΩ
R620	1	1	1	1	GD05512140	5.1KΩ
R623	1	1	1	1	GD05473140	47KΩ
R624	1	1	1	1	GD05473140	47KΩ
R625	1	1	1	1	GD05472140	4.7KΩ
R626	1	1	1	1	GD05472140	4.7KΩ
R627	1	1	1	1	GD05334140	330KΩ
R628	1	1	1	1	GD05334140	330KΩ
R629	1	1	1	1	GD05123140	12KΩ
R630	1	1	1	1	GD05123140	12KΩ
R631	1	1	1	1	GD05823140	82KΩ
R632	1	1	1	1	GD05823140	82KΩ
R633	1	1	1	1	GD05394140	390KΩ
R634	1	1	1	1	GD05394140	390KΩ
R635	1	1	1	1	GD05154140	150KΩ
R636	1	1	1	1	GD05154140	150KΩ
R637	1	1	1	1	GD05154140	150KΩ
R638	1	1	1	1	GD05154140	150KΩ
R641	1	1	1	1	GD05334140	330KΩ
R642	1	1	1	1	GD05334140	330KΩ
R643	1	1	1	1	GD05394140	390KΩ
R644	1	1	1	1	GD05394140	390KΩ
R645	1	1	1	1	GD05103140	10KΩ
R646	1	1	1	1	GD05103140	10KΩ
R647	1	1	1	1	GD05103140	10KΩ
R648	1	1	1	1	GD05103140	10KΩ
R651	1	1	1	1	GD05223140	22KΩ
R652	1	1	1	1	GD05332140	3.3KΩ
R653	1	1	1	1	GD05823140	82KΩ
R654	1	1	1	1	GD05103140	10KΩ
R655	1	1	1	1	GD05183140	18KΩ
R656	1	1	1	1	GD05392140	3.9KΩ
R657	1	1	1	1	GD05105140	1MΩ
R658	1	1	1	1	GD05105140	1MΩ
R659	1	1	1	1	GD05105140	1MΩ
R660	1	1	1	1	GD05105140	1MΩ
						P601-SEMICONDUCTORS
DS01 ≀ DS08	8	8	8	8	HD20001000	Diode 1S1555
DS52	1	1	1	1	HD20001000	Diode 1S1555
DS53	1	1	1	1	HD20001000	Diode 1S1555
DS54	1	1	1	1	HD20001000	Diode 1S1555
DS81	1	1	1	1	HD30045060	Zener RD9.1E
DS82	1	1	1	1	HD30045060	Zener RD9.1E
DS83	1	1	1	1	HD20001000	Diode 1S1555
DS84	1	1	1	1	HD20001000	Diode 1S1555

M2408

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
D651	1	1	1	1	HD20001000	Diode 1S1555
QS01	1	1	1	1	HC406600B0	IC Quard Bilateral SW.
QS02	1	1	1	1	HC406600B0	IC Quard Bilateral SW.
QS04	1	1	1	1	HC406600B0	IC Quard Bilateral SW.
QS51	1	1	1	1	HT107332A0	Transistor 2SA733(P, Q)
QS52	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QS53	1	1	1	1	HT107332A0	Transistor 2SA733(P, Q)
QS54	1	1	1	1	HT326342B0	Transistor 2SC2634(R, S)
QS81	1	1	1	1	HT313832C0	Transistor 2SC1383(R, S)
QS82	1	1	1	1	HT106832C0	Transistor 2SA683(R, S)
Q601	1	1	1	1	HC10012270	IC NE652
Q602	1	1	1	1	HC10012270	IC NE652
Q603	1	1	1	1	HC10013270	IC NE654
Q604	1	1	1	1	HC10013270	IC NE654
Q611	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q612	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q613	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q614	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q651	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q652	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q653	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
						P601-MISCELLANEOUS
J601	1	1	1	1	YJ06002430	Jack, (3P)
J602	1	1	1	1	YJ06002450	Jack, (6P)
J603	1	1	1	1	YJ06002460	Jack, (7P)
J604	1	1	1	1	YJ06002440	Jack, (4P)
L601	1	1	1	1	LS10440050	M.P.X. Coil
L602	1	1	1	1	LS10440050	M.P.X. Coil
L603	1	1	1	1	LC23660600	Choke Coil, 36mH
L604	1	1	1	1	LC23660600	Choke Coil, 36mH
W601	1	1	1	1	YU05180260	Jumper Lead, (5P)
W602	1	1	1	1	YU07080260	Jumper Lead, (7P)
W604	1	1	1	1	YU04180260	Jumper Lead, (4P)
						P801-POWER SUPPLY CIRCUIT BOARD
P801	1	1	1	1	YK132T1770	P.W. Board, Power Supply
	1				ZZ156T1770	P.W. Board Assembly
		1	1		ZZ156T8770	P.W. Board Assembly
						P801-CAPACITORS
⚠C801	1	1	1	1	0A33802510	Elect 3300μF 25V
⚠C802	1	1	1	1	0A22803510	Elect 2200μF 35V
⚠C803	1	1	1	1	0A33802510	Elect 3300μF 25V
⚠C804	1	1	1	1	0A22802510	Elect 2200μF 25V
⚠C807	1	1	1	1	EA22702530	Elect 220μF 25V
⚠C808	1	1	1	1	EA22701630	Elect 220μF 16V
⚠C809	1	1	1	1	EA22701630	Elect 220μF 16V
⚠C811	1	1	1	1	0A22802510	Elect 2200μF 25V
⚠C815	1	1	1	1	EA10801630	Elect 1000μF 16V
⚠C816	1	1	1	1	0A22803510	Elect 2200μF 35V
⚠C817	1	1	1	1	DK18103560	Ceramic 0.01μF
⚠C818	1	1	1	1	DK18103560	Ceramic 0.01μF
⚠C819	1	1	1	1	DK18103560	Ceramic 0.01μF
⚠C820	1	1	1	1	DK18103560	Ceramic 0.01μF
C831	1	1	1	1	DF16104510	Film 0.1μF ±10%
⚠C832	1	1	1	1	DF16104510	Film 0.1μF ±10%
⚠C833	1	1	1	1	DF16104510	Film 0.1μF ±10%
G801	1	1	1		DK18103840	Ceramic 0.01μF 400V
G801				1	DK18103850	Ceramic 0.01μF 250V

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
						P801-RESISTORS (All Resistors are ±5%)
⚠R801	1	1	1	1	RF05033120	3.3Ω ½W, Fusible
⚠R802	1	1	1	1	RF05047140	4.7Ω Fusible
⚠R804	1	1	1	1	RF05056140	5.6Ω Fusible
⚠R821	1	1	1	1	NF02100140	10Ω ¼W, Fuse
⚠R822	1	1	1	1	GD05102140	1KΩ ¼W
R823	1	1	1	1	RF05010120	10Ω ½W, Fusible
R825	1	1	1	1	RF05022120	2.2Ω ¼W
R851	1	1	1	1	GD05561140	560Ω ¼W
R852	1	1	1	1	GD05102140	1KΩ ¼W
						P801-SEMICONDUCTORS
⚠D801	1	1	1	1	HD20027080	Diode RB-152
⚠D802	1	1	1	1	HD20027080	Diode RB-152
⚠D821	1	1	1	1	HD30021020	Zener MA1068M
D823	1	1	1	1	HD20001000	Diode 1S1555
D824	1	1	1	1	HD20020010	Diode 1S1555
⚠Q801	1	1	1	1	HC38515090	IC NJM78M15
⚠Q802	1	1	1	1	HC38512090	IC NJM78M12
⚠Q803	1	1	1	1	HC39512090	IC NJM79M12
⚠Q821	1	1	1	1	HT313832C0	Transitor 2SC1383(R, S)
						P801-MISCELLANEOUS
J801	1	1	1	1	YJ06002460	Jack, (7P)
J802	1	1	1	1	YJ06002440	Jack, (4P)
J803	1			1	YL01010040	Terminal
J804	1			1	YL01010040	Terminal
⚠L801	1				TS15715110	Power Transformer
⚠L801		1	1		TS15716070	Power Transformer
⚠L801				1	TS15715100	Power Transformer
⚠S801	1				SP01010610	Push Switch, Power
⚠S801		1	1		SP01010600	Push Switch, Power
⚠S801				1	SP01010620	Push Switch, Power
P851	1	1	1	1	YP06002370	Plug, (2P)
W801	1	1	1	1	YB00350150	Connective Cord, (4P)
						P901-DBX CIRCUIT BOARD
P901	1	1	1	1	YN142T2220	P.W. Board, DBX
	1	1	1		ZZ142T2220	P.W. Board Assembly
						P901-CAPACITORS
C901	1	1	1	1	DF15334350	Film 0.33μF ±5%
C902	1	1	1	1	DF15334350	Film 0.33μF ±5%
C903	1	1	1	1	DF15334350	Film 0.33μF ±5%
C904	1	1	1	1	DF15334350	Film 0.33μF ±5%
C905	1	1	1	1	DF15684350	Film 0.68μF ±5%
C906	1	1	1	1	DF15684350	Film 0.68μF ±5%
C907	1	1	1	1	DF15223350	Film 0.022μF ±5%
C908	1	1	1	1	DF15223350	Film 0.022μF ±5%
C909	1	1	1	1	DF15472300	Film 4700pF ±5%
C910	1	1	1	1	DF15472300	Film 4700pF ±5%
C911	1	1	1	1	EV68600360	Elect 68μF 3V
C912	1	1	1	1	EV68600360	Elect 68μF 3V
C913	1	1	1	1	DF15391550	Film 390pF ±5%
C914	1	1	1	1	DF15391550	Film 390pF ±5%
C915	1	1	1	1	EA10602530	Elect 10μF 25V
C916	1	1	1	1	EA10505030	Elect 1μF 50V
C917	1	1	1	1	DF15104350	Film 0.1μF ±5%
C918	1	1	1	1	DF15104350	Film 0.1μF ±5%
C919	1	1	1	1	DF15104350	Film 0.1μF ±5%
C920	1	1	1	1	DF15104350	Film 0.1μF ±5%

M2409

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
C921	1	1	1	1	DF15332300	Film 3300pF ±5%
C922	1	1	1	1	DF15332300	Film 3300pF ±5%
C923	1	1	1	1	DF15331550	Film 330pF ±5%
C924	1	1	1	1	DF15331550	Film 330pF ±5%
C925	1	1	1	1	DF15332300	Film 3300pF ±5%
C926	1	1	1	1	DF15332300	Film 3300pF ±5%
C927	1	1	1	1	EA33405030	Elect 0.33μF 50V
C928	1	1	1	1	EA33405030	Elect 0.33μF 50V
C929	1	1	1	1	DF15333350	Film 0.033μF ±5%
C930	1	1	1	1	DF15333350	Film 0.033μF ±5%
C931	1	1	1	1	EA10602530	Elect 10μF 25V
C932	1	1	1	1	EA10602530	Elect 10μF 25V
C933	1	1	1	1	EA10505030	Elect 1μF 50V
C934	1	1	1	1	EA10505030	Elect 1μF 50V
C935	1	1	1	1	EA47601030	Elect 47μF 10V
C936	1	1	1	1	EA47601030	Elect 47μF 10V
C937	1	1	1	1	EA10602530	Elect 10μF 25V
C938	1	1	1	1	EA10602530	Elect 10μF 25V
C939	1	1	1	1	EQ10505030	Elect 1μF 50V
C940	1	1	1	1	EQ10505030	Elect 1μF 50V
C941	1	1	1	1	EA47601030	Elect 47μF 10V
C942	1	1	1	1	DK18103300	Ceramic 0.01μF
C943	1	1	1	1	DF15222300	Film 2200pF ±5%
C944	1	1	1	1	DF15222300	Film 2200pF ±5%
C951	1	1	1	1	DF15104350	Film 0.1μF ±5%
C952	1	1	1	1	DF15104350	Film 0.1μF ±5%
C953	1	1	1	1	DF15014350	Film 0.1μF ±5%
C954	1	1	1	1	DF15104350	Film 0.1μF ±5%
C955	1	1	1	1	DF15332300	Film 3300pF ±5%
C956	1	1	1	1	DF15332300	Film 3300pF ±5%
C957	1	1	1	1	DF15332300	Film 3300pF ±5%
C958	1	1	1	1	DF15332300	Film 3300pF ±5%
C959	1	1	1	1	DF15331550	Film 330pF ±5%
C960	1	1	1	1	DF15331550	Film 330pF ±5%
C961	1	1	1	1	EA33405030	Elect 0.33μF 50V
C962	1	1	1	1	EA33405030	Elect 0.33μF 50V
C963	1	1	1	1	DF15333350	Film 0.033μF ±5%
C964	1	1	1	1	DF15333350	Film 0.033μF ±5%
C965	1	1	1	1	EA10602530	Elect 10μF 25V
C966	1	1	1	1	EA10602530	Elect 10μF 25V
C967	1	1	1	1	DF15684350	Film 0.68μF ±5%
C968	1	1	1	1	DF15684350	Film 0.68μF ±5%
C969	1	1	1	1	DF15471550	Film 470pF ±5%
C970	1	1	1	1	DF15471550	Film 470pF ±5%
C971	1	1	1	1	EA68600360	Elect 68μF 3V
C972	1	1	1	1	EV68600360	Elect 68μF 3V
C973	1	1	1	1	DF15472300	Film 4700pF ±5%
C974	1	1	1	1	DF15472300	Film 4700pF ±5%
C975	1	1	1	1	DF15223350	Film 0.022μF ±5%
C976	1	1	1	1	DF15223350	Film 0.022μF ±5%
C977	1	1	1	1	EA10602530	Elect 10μF 25V
C978	1	1	1	1	EA10505030	Elect 1μF 50V
C979	1	1	1	1	EA10505030	Elect 1μF 50V
C980	1	1	1	1	EA10505030	Elect 1μF 50V
C981	1	1	1	1	EA47601030	Elect 47μF 10V
C982	1	1	1	1	EA47601030	Elect 47μF 10V
C983	1	1	1	1	EA10602530	Elect 10μF 25V
C984	1	1	1	1	EA10602530	Elect 10μF 25V
C985	1	1	1	1	EA10505030	Elect 1μF 50V
C986	1	1	1	1	EA10505030	Elect 1μF 50V

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
C987	1	1	1	1	EA47601030	Elect 47μF 10V
C988	1	1	1	1	DK18103300	Ceramic 0.01μF
C989	1	1	1	1	DK18103300	Ceramic 0.01μF
C990	1	1	1	1	DK18103300	Ceramic 0.01μF
C991	1	1	1	1	DF15472300	Film 4700pF ±5%
C992	1	1	1	1	DF15472300	Film 4700pF ±5%
						P901-RESISTORS **(All Resistors are ±5% & ¼W)**
R791	1	1	1	1	GM11410010	1KΩ 1%
R792	1	1	1	1	RA02020800	20KΩ(B), Trimming
R793	1	1	1	1	GD05124140	120KΩ
R794	1	1	1	1	GD05124140	120KΩ
R795	1	1	1	1	GD05124140	120KΩ
R796	1	1	1	1	GD05124140	120KΩ
R901	1	1	1	1	GD05105140	1MΩ
R902	1	1	1	1	GD05105140	1MΩ
R903	1	1	1	1	GD05272140	2.7KΩ
R904	1	1	1	1	GD05272140	2.7KΩ
R905	1	1	1	1	GD05103140	10KΩ
R906	1	1	1	1	GD05103140	10KΩ
R907	1	1	1	1	GD05563140	56KΩ
R908	1	1	1	1	GD05563140	56KΩ
R909	1	1	1	1	GD05124140	120KΩ
R910	1	1	1	1	GD05124140	120KΩ
R911	1	1	1	1	GD05332140	3.3KΩ
R912	1	1	1	1	GD05332140	3.3KΩ
R913	1	1	1	1	GD05153140	15KΩ
R914	1	1	1	1	GD05153140	15KΩ
R915	1	1	1	1	GD05472140	4.7KΩ
R916	1	1	1	1	GD05472140	4.7KΩ
R917	1	1	1	1	GD05151140	150Ω
R918	1	1	1	1	GD05151140	150Ω
R919	1	1	1	1	GD05153140	15KΩ
R920	1	1	1	1	GD05153140	15KΩ
R921	1	1	1	1	GD05472140	4.7KΩ
R922	1	1	1	1	GD05472140	4.7KΩ
R923	1	1	1	1	GD05154140	150KΩ
R924	1	1	1	1	GD05154140	150KΩ
R925	1	1	1	1	GD05224140	220KΩ
R926	1	1	1	1	GD05224140	220KΩ
R927	1	1	1	1	GD05472140	4.7KΩ
R928	1	1	1	1	GD05472140	4.7KΩ
R929	1	1	1	1	GD05153140	15KΩ
R930	1	1	1	1	GD05153140	15KΩ
R931	1	1	1	1	GD05153140	15KΩ
R932	1	1	1	1	GD05153140	15KΩ
R933	1	1	1	1	GD05332140	3.3KΩ
R934	1	1	1	1	GD05332140	3.3KΩ
R935	1	1	1	1	GD05333140	33KΩ
R936	1	1	1	1	GD05333140	33KΩ
R937	1	1	1	1	GD05103140	10KΩ
R938	1	1	1	1	GD05103140	10KΩ
R939	1	1	1	1	GD05102140	1KΩ
R940	1	1	1	1	GD05102140	1KΩ
R941	1	1	1	1	GD05122140	1.2KΩ
R942	1	1	1	1	GD05122140	1.2KΩ
R943	1	1	1	1	RA02030800	20KΩ(B), Trimming
R944	1	1	1	1	RA02030800	20KΩ(B), Trimming

m2410

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
R945	1	1	1	1	GD05122140	1.2KΩ
R946	1	1	1	1	GD05122140	1.2KΩ
R947	1	1	1	1	GD05223140	22KΩ
R948	1	1	1	1	GD05223140	22KΩ
R949	1	1	1	1	GM11410010	1KΩ 1%
R950	1	1	1	1	RA02020800	20KΩ(B), Trimming
R951	1	1	1	1	GD05105140	1MΩ
R952	1	1	1	1	GD05105140	1MΩ
R953	1	1	1	1	GD05122140	1.2KΩ
R954	1	1	1	1	GD05122140	1.2KΩ
R955	1	1	1	1	GD05154140	150KΩ
R956	1	1	1	1	GD05154140	150KΩ
R957	1	1	1	1	GD05224140	220KΩ
R958	1	1	1	1	GD05224140	220KΩ
R959	1	1	1	1	GD05472140	4.7KΩ
R960	1	1	1	1	GD05472140	4.7KΩ
R961	1	1	1	1	GD05153140	15KΩ
R962	1	1	1	1	GD05153140	15KΩ
R963	1	1	1	1	GD05153140	15KΩ
R964	1	1	1	1	GD05153140	15KΩ
R965	1	1	1	1	GD05332140	3.3KΩ
R966	1	1	1	1	GD05332140	3.3KΩ
R967	1	1	1	1	GD05333140	33KΩ
R968	1	1	1	1	GD05333140	33KΩ
R969	1	1	1	1	GD05153140	15KΩ
R970	1	1	1	1	GD05153140	15KΩ
R971	1	1	1	1	GD05472140	4.7KΩ
R972	1	1	1	1	GD05472140	4.7KΩ
R973	1	1	1	1	GD05151140	150Ω
R974	1	1	1	1	GD05151140	150Ω
R975	1	1	1	1	GD05153140	15KΩ
R976	1	1	1	1	GD05153140	15KΩ
R977	1	1	1	1	GD05472140	4.7KΩ
R978	1	1	1	1	GD05472140	4.7KΩ
R979	1	1	1	1	GD05103140	10KΩ
R980	1	1	1	1	GD05103140	10KΩ
R981	1	1	1	1	GD05102140	1KΩ
R982	1	1	1	1	GD05102140	1KΩ
R983	1	1	1	1	GD05122140	1.2KΩ
R984	1	1	1	1	GD05122140	1.2KΩ
R985	1	1	1	1	GD05223140	22KΩ
R986	1	1	1	1	GD05223140	22KΩ
R987	1	1	1	1	GD05122140	1.2KΩ
R988	1	1	1	1	GD05122140	1.2KΩ
R989	1	1	1	1	GD05223140	22KΩ
R990	1	1	1	1	GD05223140	22KΩ
						P901-SEMICONDUCTORS
Q901	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q902	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q903	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q904	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q905	1	1	1	1	HC10039020	IC AN6291
Q906	1	1	1	1	HC10003090	IC NJM4558D
Q907	1	1	1	1	HC10003090	IC NJM4558D
Q951	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q952	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
Q953	1	1	1	1	HC10039020	IC AN6291
Q954	1	1	1	1	HC10040020	IC AN6558
Q955	1	1	1	1	HC10003090	IC NJM4558D

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
						PE01-RECORD VOLUME CIRCUIT BOARD
PE01	1	1	1	1	YK132T1720	P.W. Board, Record Volume
	1	1	1		ZZ132T1720	P.W. Board Assembly
RE91	1	1	1	1	RD05030120	Variable Resistor, 50KΩ(L)
RE92	1	1	1	1	RD05030120	Variable Resistor, 50KΩ(R)
						PE02-OUTPUT VOLUME CIRCUIT BOARD
PE02	1	1	1	1	YK132T1790	P.W. Board, Output Volume
	1	1	1		ZZ156T1790	P.W. Board Assembly
RJ35	1	1	1	1	RM01030220	Variable Resistor, 10KΩ
						PJ01-MAIN CIRCUIT BOARD
PJ01	1	1	1	1	YK132T1710	P.W. Board, Main
	1	1	1		ZZ156T1710	P.W. Board Assembly
						PJ01-CAPACITORS
CE01	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CE02	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CE03	1	1	1	1	EQ22505030	Elect 2.2μF 50V
CE04	1	1	1	1	EQ22505030	Elect 2.2μF 50V
CE05	1	1	1	1	EA47601630	Elect 47μF 16V
CE06	1	1	1	1	EA47601630	Elect 47μF 16V
CE09	1	1	1	1	EA10601630	Elect 10μF 16V
CE10	1	1	1	1	EA10601630	Elect 10μF 16V
⚠CE11	1	1	1	1	EA10701630	Elect 100μF 16V
⚠CE12	1	1	1	1	EA10701630	Elect 100μF 16V
CE91	1	1	1	1	DK18103310	Ceramic 0.01μF
CE92	1	1	1	1	DK18103310	Ceramic 0.01μF
CJ01	1	1	1	1	DF55681520	Film 680pF ±5%
CJ02	1	1	1	1	DF55681520	Film 680pF ±5%
CJ03	1	1	1	1	EA22701630	Elect 220μF 16V
CJ04	1	1	1	1	EA22701630	Elect 220μF 16V
CJ05	1	1	1	1	DF15183350	Film 0.018μF
CJ06	1	1	1	1	DF15183350	Film 0.018μF
CJ07	1	1	1	1	DF55152520	Film 470pF ±5%
CJ08	1	1	1	1	DF55152520	Film 470pF ±5%
CJ09	1	1	1	1	DF55821520	Flim 470pF ±5%
CJ10	1	1	1	1	DF55821520	Film 470pF ±5%
CJ11	1	1	1	1	DF15561550	Film 1500pF
CJ12	1	1	1	1	DF15561550	Film 1500pF
CJ13	1	1	1	1	DF15393350	Film 0.039μF ±5%
CJ14	1	1	1	1	DF15393350	Film 0.039μF ±5%
CJ15	1	1	1	1	DF15153350	Flim 0.015μF ±5%
CJ16	1	1	1	1	DF15153350	Film 0.015μF ±5%
CJ19	1	1	1	1	DF15821550	Film 820pF ±5%
CJ20	1	1	1	1	DF15821550	Film 820pF ±5%
CJ21	1	1	1	1	EA10505030	Elect 1μF 50V
CJ22	1	1	1	1	EA10505030	Elect 1μF 50V
CJ23	1	1	1	1	EA47601630	Elect 47μF 16V
CJ24	1	1	1	1	EA47601630	Elect 47μF 16V
CJ25	1	1	1	1	EA10701630	Elect 100μF 16V
CJ26	1	1	1	1	EA10701630	Elect 100μF 16V
CJ27	1	1	1	1	OA10505010	Elect 1μF 50V
CJ28	1	1	1	1	OA10505010	Elect 1μF 50V
CJ29	1	1	1	1	EA47601630	Elect 47μF 16V
CJ30	1	1	1	1	EA47601630	Elect 47μF 16V
CJ31	1	1	1	1	EA47601630	Elect 47μF 16V
CJ32	1	1	1	1	EA47601630	Elect 47μF 16V

M2411

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
CJ33	1	1	1	1	DD15680370	Ceramic 68pF ±5%
CJ34	1	1	1	1	DD15680370	Ceramic 68pF ±5%
CJ35	1	1	1	1	DD15680370	Ceramic 68pF ±5%
CJ36	1	1	1	1	DD15680370	Ceramic 68pF ±5%
CJ37	1	1	1	1	EA10701630	Elect 100μF 16V
CJ38	1	1	1	1	EA10701630	Elect 100μF 16V
⚠CJ41	1	1	1	1	OA22802510	Elect 2200μF 25V
⚠CJ42	1	1	1	1	OA22802510	Elect 2200μF 25V
CJ43	1	1	1	1	DF16104510	Film 0.1μF ±10%
CJ44	1	1	1	1	DF16104510	Film 0.1μF ±10%
CJ45	1	1	1	1	DF16104510	Film 0.1μF ±10%
CJ71	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ72	1	1	1	1	DF15473350	Film 0.047μF ±5%
CJ73	1	1	1	1	DF15102300	Film 0.001μF ±5%
CJ74	1	1	1	1	DF15101370	Film 100pF ±5%
CJ75	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ76	1	1	1	1	DF15333350	Film 0.033μF ±5%
CJ77	1	1	1	1	DF15104350	Film 0.1μF ±5%
CJ81	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ82	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ85	1	1	1	1	EA10601630	Elect 10μF 16V
CJ86	1	1	1	1	EA10601630	Elect 10μF 16V
CJ89	1	1	1	1	EA10601630	Elect 10μF 16V
CJ90	1	1	1	1	EA10601630	Elect 10μF 16V
CJ91	1	1	1	1	EA47601630	Elect 47μF 16V
CJ93	1	1	1	1	DK18103320	Ceramic 0.01μF
CU01	1	1	1	1	DD15221370	Ceramic 220pF ±5%
CU02	1	1	1	1	DD15221370	Ceramic 220pF ±5%
CU03	1	1	1	1	EA47503510	Elect 4.7μF 35V
CU04	1	1	1	1	DK18103310	Ceramic 0.01μF
CU05	1	1	1	1	EA33601630	Elect 33μF 16V
⚠CU07	1	1	1	1	EA10701630	Elect 100μF 16V
⚠CU08	1	1	1	1	EA22702530	Elect 220μF 25V
CU09	1	1	1	1	DF15104350	Film 0.1μF ±5%
CU10	1	1	1	1	EQ47503530	Elect 4.7μF 35V
CU11	1	1	1	1	EA47601030	Elect 47μF 10V
CU12	1	1	1	1	EA47602530	Elect 47μF 25V
CU13	1	1	1	1	EA47701630	Elect 470μF 16V
CU21	1	1	1	1	EA47601630	Elect 47μF 16V
CU22	1	1	1	1	DK18223310	Ceramic 0.022μF
CU23	1	1	1	1	DK18223310	Ceramic 0.022μF
CU24	1	1	1	1	EA10701630	Elect 100μF 16V
CU26	1	1	1	1	DK18103310	Ceramic 0.01μF
CU27	1	1	1	1	DK18103310	Ceramic 0.01μF
CU28	1	1	1	1	DK18103310	Ceramic 0.01μF
CU29	1	1	1	1	DK18103310	Ceramic 0.01μF
						PJ01-RESISTORS (All Resistors are ±5% & ¼W)
RE01	1	1	1	1	GD05333140	33KΩ
RE02	1	1	1	1	GD05333140	33KΩ
RE05	1	1	1	1	GD05103140	10KΩ
RE06	1	1	1	1	GD05103140	10KΩ
RE07	1	1	1	1	GD05821140	820Ω
RE08	1	1	1	1	GD05821140	820Ω
RE09	1	1	1	1	GD05683140	68KΩ
RE10	1	1	1	1	GD05683140	68KΩ
RE11	1	1	1	1	GD05222140	2.2KΩ
RE12	1	1	1	1	GD05222140	2.2KΩ
⚠RE13	1	1	1	1	GA05181010	180Ω 1W
⚠RE14	1	1	1	1	GA05181010	180Ω 1W
RE21	1	1	1	1	GD05153140	15KΩ
RE22	1	1	1	1	GD05153140	15KΩ
RE23	1	1	1	1	GD05473140	47KΩ

m2412

REF. DESIG.	Q'TY U	Q'TY N	Q'TY A	Q'TY F	PART NO.	DESCRIPTION
RE24	1	1	1	1	GD05473140	47KΩ
RE25	1	1	1	1	GD05153140	15KΩ
RE26	1	1	1	1	GD05562140	5.6KΩ
RE27	1	1	1	1	GD05392140	3.9KΩ
RJ01	1	1	1	1	GD05473140	47KΩ
RJ02	1	1	1	1	GD05473140	47KΩ
RJ03	1	1	1	1	GD05560140	56Ω
RJ04	1	1	1	1	GD05560140	56Ω
RJ05	1	1	1	1	GD05184140	180KΩ
RJ06	1	1	1	1	GD05184140	180KΩ
RJ07	1	1	1	1	GD05153140	15KΩ
RJ08	1	1	1	1	GD05153140	15KΩ
RJ09	1	1	1	1	GD05183140	18KΩ
RJ10	1	1	1	1	GD05183140	18KΩ
RJ11	1	1	1	1	GD05103140	10KΩ
RJ12	1	1	1	1	GD05103140	10KΩ
RJ13	1	1	1	1	GD05122140	1.2KΩ
RJ14	1	1	1	1	GD05122140	1.2KΩ
RJ15	1	1	1	1	GD08224140	8.2KΩ
RJ16	1	1	1	1	GD05822140	8.2KΩ
RJ17	1	1	1	1	GD05182140	1.8KΩ
RJ18	1	1	1	1	GD05182140	1.8KΩ
RJ19	1	1	1	1	GD05334140	330KΩ
RJ20	1	1	1	1	GD05334140	330KΩ
RJ21	1	1	1	1	GD05153140	15KΩ
RJ22	1	1	1	1	GD05153140	15KΩ
RJ23	1	1	1	1	RA[illegible]20800	3KΩ, Trimming
RJ24	1	1	1	1	RA03020800	3KΩ, Trimming
RJ25	1	1	1	1	RA05020800	5KΩ, Trimming
RJ26	1	1	1	1	RA05020800	5KΩ, Trimming
RJ27	1	1	1	1	GD05101140	100Ω
RJ29	1	1	1	1	GD05101140	100Ω
RJ29	1	1	1	1	GD05822140	8.2KΩ
RJ30	1	1	1	1	GD05822140	8.2KΩ
RJ31	1	1	1	1	GD05822140	8.2KΩ
RJ32	1	1	1	1	GD05822140	8.2KΩ
RJ33	1	1	1	1	GD05153140	15KΩ
RJ34	1	1	1	1	GD05153140	15KΩ
RJ37	1	1	1	1	GD05102140	1KΩ
RJ38	1	1	1	1	GD05102140	1KΩ
RJ39	1	1	1	1	GD05473140	47KΩ
RJ40	1	1	1	1	GD05473140	47KΩ
RJ41	1	1	1	1	GD05103140	10KΩ
RJ42	1	1	1	1	GD05103140	10KΩ
RJ43	1	1	1	1	GD05473140	47KΩ
RJ44	1	1	1	1	GD05473140	47KΩ
RJ45	1	1	1	1	GD05680140	68Ω
RJ46	1	1	1	1	GD05680140	68Ω
RJ47	1	1	1	1	GD05561140	560Ω
RJ48	1	1	1	1	GD05561140	560Ω
RJ49	1	1	1	1	GD05102140	1KΩ
RJ50	1	1	1	1	GD05102140	1KΩ
RJ51	1	1	1	1	GD05473140	47KΩ
RJ52	1	1	1	1	GD05473140	47KΩ
RJ53	1	1	1	1	GD05103140	10KΩ
RJ54	1	1	1	1	GD05103140	10KΩ
RJ55	1	1	1	1	GD05473140	47KΩ
RJ56	1	1	1	1	GD05473140	47KΩ
RJ57	1	1	1	1	GD05102140	1KΩ
RJ58	1	1	1	1	GD05102140	1KΩ

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
RJ59	1	1	1	1	GD05103140	10KΩ
RJ60	1	1	1	1	GD05103140	10KΩ
RJ61	1	1	1	1	GD05102140	1KΩ
RJ62	1	1	1	1	GD05102140	1KΩ
RJ63	1	1	1	1	GD05103140	15KΩ
RJ64	1	1	1	1	GD05153140	15KΩ
RJ65	1	1	1	1	GD05102140	1KΩ
RJ66	1	1	1	1	GD05102140	1KΩ
RJ67	1	1	1	1	GD05561140	560Ω
RJ68	1	1	1	1	GD05561140	560Ω
RJ69	1	1	1	1	NF02101140	100Ω, Fuse
RJ70	1	1	1	1	GD05154140	150KΩ
RJ71	1	1	1	1	GD05272140	2.7KΩ
RJ72	1	1	1	1	GD05562140	5.6KΩ
RJ73	1	1	1	1	GD05225140	2.2MΩ
RJ74	1	1	1	1	GD05562140	5.6KΩ
RJ75	1	1	1	1	GD05471140	470Ω
RJ76	1	1	1	1	GD05823140	82KΩ
RJ77	1	1	1	1	GD05684140	680KΩ
RJ78	1	1	1	1	GD05561140	560Ω
RJ79	1	1	1	1	GD05472140	4.7KΩ
RJ80	1	1	1	1	GD05333140	33KΩ
RJ81	1	1	1	1	GD05102140	1KΩ
RJ82	1	1	1	1	GD05104140	100KΩ
RJ83	1	1	1	1	GD05104140	100KΩ
RJ84	1	1	1	1	GD05104140	100KΩ
RJ85	1	1	1	1	GD05103140	10KΩ
RJ86	1	1	1	1	GD05103140	10KΩ
RJ87	1	1	1	1	GD05821140	820Ω
RJ88	1	1	1	1	GD05821140	820Ω
RJ89	1	1	1	1	GD05104140	100KΩ
RJ90	1	1	1	1	GD05104140	100KΩ
RJ91	1	1	1	1	GD05562140	5.6KΩ
RJ92	1	1	1	1	GD05562140	5.6KΩ
RJ93	1	1	1	1	GG05471120	470Ω ½W
RJ94	1	1	1	1	GD05333140	33KΩ
RJ95	1	1	1	1	GD05124140	120KΩ
RJ96	1	1	1	1	GD05562140	5.6KΩ
⚠RJ97	1	1	1	1	GA05471010	470Ω 1W
⚠RJ98	1	1	1	1	GA05471010	470Ω 1W
⚠RJ99	1	1	1	1	NF02101140	100Ω ±2%, Fuse
RU01	1	1	1	1	GD05105140	1MΩ
RU02	1	1	1	1	GD05102140	1KΩ
RU03	1	1	1	1	GD05102140	1KΩ
RU04	1	1	1	1	GD05392140	3.9KΩ
RU05	1	1	1	1	GD05392140	3.9KΩ
RU06	1	1	1	1	GD05153140	15KΩ
RU07	1	1	1	1	GD05473140	47KΩ
RU08	1	1	1	1	GD05222140	2.2KΩ
⚠RU09	1	1	1	1	RF05056120	5.6Ω ½W, Fusible
RU10	1	1	1	1	GD05103140	10KΩ
RU11	1	1	1	1	GD05103140	10KΩ
RU12	1	1	1	1	GD05181140	180Ω
RU13	1	1	1	1	GD05181140	180Ω
RU14	1	1	1	1	GD05181140	180Ω
RU15	1	1	1	1	GD05181140	180Ω
RU16	1	1	1	1	GD05181140	180Ω
RU17	1	1	1	1	GD05181140	180Ω
RU18	1	1	1	1	GD05472140	4.7KΩ
RU19	1	1	1	1	GD05561140	560Ω
RU20	1	1	1	1	GD05471140	470Ω

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
RU21	1	1	1	1	GD05222140	2.2KΩ
RU22	1	1	1	1	GD05103140	10KΩ
RU23	1	1	1	1	GD05103140	10KΩ
RU24	1	1	1	1	GD05102140	1KΩ
RU25	1	1	1	1	GD05102140	1KΩ
RU26	1	1	1	1	GD05103140	10KΩ
RU27	1	1	1	1	GD05103140	10KΩ
RU28	1	1	1	1	GD05103140	10KΩ
RU29	1	1	1	1	GD05472140	4.7KΩ
RU30	1	1	1	1	GD05103140	10KΩ
RU31	1	1	1	1	GD05103140	10KΩ
RU32	1	1	1	1	GD05103140	10KΩ
RU33	1	1	1	1	GD05103140	10KΩ
RU34	1	1	1	1	GD05103140	10KΩ
RU35	1	1	1	1	GD05103140	10KΩ
RU36	1	1	1	1	GD05103140	10KΩ
RU37	1	1	1	1	GD05103140	10KΩ
RU38	1	1	1	1	GD05103140	10KΩ
RU39	1	1	1	1	GD05103140	10KΩ
RU40	1	1	1	1	GD05153140	15KΩ
RU41	1	1	1	1	GD05152140	1.5KΩ
RU42	1	1	1	1	GD05223140	22KΩ
RU43	1	1	1	1	GD05223140	22KΩ
RU44	1	1	1	1	GD05102140	1KΩ
RU45	1	1	1	1	GD05102140	1KΩ
RU46	1	1	1	1	GD05122140	1.2KΩ
RU47	1	1	1	1	GD05392140	3.9KΩ
RU48	1	1	1	1	GD05392140	3.9KΩ
RU49	1	1	1	1	GA05100020	10Ω 2W
RU50	1	1	1	1	GD05222140	2.2KΩ
RU51	1	1	1	1	GD05562140	5.6KΩ
RU71	1	1	1	1	GD05561140	560Ω
RU72	1	1	1	1	GD05561140	560Ω
RU73	1	1	1	1	GD05561140	560Ω
RU74	1	1	1	1	GD05122140	1.2KΩ
RU75	1	1	1	1	GD05122140	1.2KΩ
⚠RU81	1	1	1	1	GG05331120	330Ω ½W
⚠RU82	1	1	1	1	GG05181120	180Ω ½W
RU83	1	1	1	1	GD05102140	1KΩ
RU84	1	1	1	1	GD05562140	5.6KΩ
RU85	1	1	1	1	NF02100140	10Ω ±2% ½W
RU86	1	1	1	1	GD05122140	1.2KΩ
RU87	1	1	1	1	GD05153140	15KΩ
RU88	1	1	1	1	GD05563140	56KΩ
⚠R807	1	1	1	1	GA05681010	680Ω 1W
⚠R808	1	1	1	1	GA05221010	220Ω 1W
⚠R809	1	1	1	1	GA05221010	220Ω 1W
R810	1	1	1	1	GD05332140	3.3KΩ
⚠R811	1	1		1	GA05681010	680Ω 1W
R812	1	1	1	1	GD05332140	3.3KΩ
R813	1	1	1	1	RA05010800	500Ω, Trimming
⚠R815	1	1	1	1	RF05056120	5.6Ω ½W, Fusible
⚠R816	1	1	1	1	RF05056120	5.6KΩ ½W, Fusible
⚠R817	1	1	1	1	RF05056140	5.6KΩ, Fusible
R824	1	1	1	1	RE05047140	4.7Ω, Fusible
R993				1	GD05681140	680Ω
R994				1	GD05153140	15KΩ
R999				1	GD05122140	1.2KΩ

M2413

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION	
						PJ01-SEMICONDUCTORS	
DE21	1	1	1	1	HD20001000	Diode	1S1555
DE22	1	1	1	1	HD20001000	Diode	1S1555
DU01	1	1	1	1	HD20001000	Diode	1S1555
DU02	1	1	1	1	HD20001000	Diode	1S1555
DU03	1	1	1	1	HD20001000	Diode	1S1555
DU04	1	1	1	1	HD20001000	Diode	1S1555
DU05	1	1	1	1	HD20001000	Diode	1S1555
DU06	1	1	1	1	HD30018060	Zener	RD12E-B3
DU07	1	1	1	1	HD20015030	Diode	DS135D
DU08	1	1	1	1	HD20001000	Diode	1S1555
DU10	1	1	1	1	HD20001000	Diode	1S1555
DU11	1	1	1	1	HD20001000	Diode	1S1555
DU12	1	1	1	1	HD20015030	Diode	DS135D
DU13	1	1	1	1	HD20015030	Diode	DS135D
DU14	1	1	1	1	HD20015030	Diode	DS145D
DU15	1	1	1	1	HD20001000	Diode	1S1555
DU16	1	1	1	1	HD20001000	Diode	1S1555
DU21	1	1	1	1	HD20001000	Diode	1S1555
DU22	1	1	1	1	HD20001000	Diode	1S1555
DU23	1	1	1	1	HD20001000	Diode	1S1555
DU52	1	1	1	1	HD20001000	Diode	1S1555
⚠D806	1	1	1	1	HD30050060	Zener	RD15E-B3
⚠D807	1	1	1	1	HD30009060	Zener	RD6.2E-B2
⚠D808	1	1	1	1	HD30064060	Zener	RD6.2E-B2
⚠D809	1	1	1	1	HD30033060	Zener	RD3.3E-B2
⚠D810	1	1	1	1	HD30034060	Zener	RD8.2E-B2
D811	1	1	1	1	HD20001000	Diode	1S1555
D812	1	1	1	1	HD20001210	Diode	1S2473
D813	1	1	1	1	HD20001000	Diode	1S1555
QE01	1	1	1	1	HC10040020	IC	AN6558
QE21	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QE22	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QE23	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QE24	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QE25	1	1	1	1	HT107332A0	Transistor	2SA733(P, Q)
QJ01	1	1	1	1	HC10017090	IC	NJM2043D-D
QJ02	1	1	1	1	HC10082050	IC	TA7325P
QJ03	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ04	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ07	1	1	1	1	HC10016090	IC	NJM4560D
QJ08	1	1	1	1	HC10003090	IC	NJM4558D
QJ09	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ10	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ11	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ12	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ71	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ72	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ73	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ74	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ75	1	1	1	1	HT107332A0	Transistor	2SA733(P, Q)
QJ76	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QJ77	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QU01	1	1	1	1	HC10075030	IC	LN6402A-750
QU02	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU03	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU04	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU05	1	1	1	1	HT107332A0	Transistor	2SA733(P, Q)

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION	
QU06	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU07	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU08	1	1	1	1	HT313832C0	Transistor	2SC1383(R, S)
QU09	1	1	1	1	HT313832C0	Transistor	2SC1383(R, S)
QU10	1	1	1	1	HT40894000	Transistor	2SD894
QU11	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU12	1	1	1	1	HT106832C0	Transistor	2SA683(R, S)
QU13	1	1	1	1	HT106832C0	Transistor	2SA683(R, S)
QU14	1	1	1	1	HT313832C0	Transistor	2SC1383(R, S)
QU15	1	1	1	1	HT313832C0	Transistor	2SC1383(R, S)
QU16	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU17	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU18	1	1	1	1	HT107332A0	Transistor	2SA733(R, S)
QU19	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
⚠QU21	1	1	1	1	HT403131E0	Transistor	2SD313(E)
QU22	1	1	1	1	HT308282A0	Transistor	2SC828(E, S)
QU23	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
QU24	1	1	1	1	HT326342A0	Transistor	2SC2634(R, S)
QU25	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
⚠Q804	1	1	1	1	HT403131E0	Transistor	2SD313(E)
⚠Q805	1	1	1	1	HT403131E0	Transistor	2SD313(E)
⚠Q806	1	1	1	1	HT403131E0	Transistor	2SD313(E)
Q807	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
⚠Q808	1	1	1	1	HT403131E0	Transistor	2SD313(E)
Q809	1	1	1	1	HT308282A0	Transistor	2SC828(R, S)
Q999	1	1	1	1	HT326342A0	Transistor	2SC2734(R, S)
						PJ01-MISCELLANEOUS	
JE01	1	1	1		YJ01001780	Jack, (3P) Mic L	
JE01				1	YJ01002110	Jack, (3P) Mic L	
JE02	1	1	1		YJ01001780	Jack, (3P) Mic R	
JE02				1	YJ01002110	Jack, (3P) Mic R	
JJ01	1	1	1	1	YP06002400	Plug, (4P)	
JJ02	1			1	YT02040480	Terminal, (4P) RCA Jack	
JJ02		1	1		YT02040470	Terminal, (4P) RCA Jack	
JJ05	1	1	1	1	YJ90000220	Jack, (9P) Remote	
JJ06	1	1	1	1	YP06001070	Plug, (9P)	
JJ07	1	1	1	1	YP06002430	Plug, (8P)	
JJ08	1	1	1	1	YJ06002390	Jack, (5P)	
JJ09	1	1	1	1	YJ06002270	Jack, (8P)	
JJ10	1	1	1	1	YJ06002270	Jack, (8P)	
JJ12	1	1	1	1	YJ06002460	Jack, (7P)	
JJ13	1	1	1	1	YJ06002430	Jack, (3P)	
JJ51	1	1	1	1	YJ06002390	Jack, (5P)	
JJ52	1	1	1	1	YJ06002500	Jack, (2P)	
JJ53	1	1	1	1	YJ06002370	Plug, (2P)	
SE01	1	1	1	1	SP04010380	Push Switch	
SU01	1	1	1	1	SP02060040	Push Switch	
WJ01	1	1	1	1	YU03180260	Jumper Lead, (3P)	
WJ02	1	1	1	1	YU03160260	Jumper Lead, (3P)	
WJ04	1	1	1	1	YU07260260	Jumper Lead, (7P)	
WJ05	1	1	1	1	YU03520260	Jumper Lead, (3P)	
WJ06	1	1	1	1	YU06520260	Jumper Lead, (6P)	
WJ07	1	1	1	1	YU07520260	Jumper Lead, (7P)	
WJ08	1	1	1	1	YU03500260	Jumper Lead, (3P)	
WJ09	1	1	1	1	YU07100260	Jumper Lead, (7P)	
WJ10	1	1	1	1	YU06120260	Jumper Lead, (6P)	
WJ11	1	1	1	1	YU03280260	Jumper Lead, (3P)	
WJ12	1	1	1	1	YU03300260	Jumper Lead, (3P)	
WJ14	1	1	1	1	YU02260260	Jumper Lead, (2P)	
WJ15	1	1	1	1	YU02100260	Jumper Lead, (2P)	
W513	1	1	1	1	YB00250230	Connective Cord, (6P)	
XU01	1	1	1	1	FQ04003010	Seramic Vib. 400kHz	

M2414

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
						PJ02-HEADPHONE JACK CIRCUIT BOARD
PJ02	1	1	1	1	YK132T1750	P.W. Board, Headphone Jack
	1	1	1		ZZ132T1750	P.W. Board Assembly
CE93	1	1	1	1	DK18103310	Ceramic Cap. 0.01μF
JJ04	1	1	1		YJ01001790	Jack, Headphone
JJ04				1	YJ01002080	Jack, Headphone
						PQ01-AUTO BIAS MAIN CIRCUIT BOARD
PQ01	1	1	1	1	YK132T2310	P.W. Board, Auto Bias Main
	1	1	1		ZZ132T2310	P.W. Board Assembly
						PQ01-CAPACITORS
CK01	1	1	1	1	EA10601630	Elect 10μF 16V
CK02	1	1	1	1	EA10601630	Elect 10μF 16V
CK03	1	1	1	1	EA10601630	Elect 10μF 16V
CK04	1	1	1	1	EA10601630	Elect 10μF 16V
CK05	1	1	1	1	EA10505030	Elect 1μF 50V
CK06	1	1	1	1	EA10505030	Elect 1μF 50V
CK07	1	1	1	1	DD15220370	Ceramic 22pF ±5%
CK08	1	1	1	1	DD15220370	Ceramic 22pF ±5%
CK09	1	1	1	1	DF15182300	Film 1800pF ±5%
CK10	1	1	1	1	DF15182300	Film 1800pF ±5%
CK11	1	1	1	1	EA10505030	Elect 1μF 50V
CK12	1	1	1	1	EA10505030	Elect 1μF 50V
CK13	1	1	1	1	DF15102300	Film 0.001μF ±5%
CK14	1	1	1	1	DF15102300	Film 0.001μF ±5%
CK15	1	1	1	1	DK18473320	Ceramic 0.047μF
CK16	1	1	1	1	DK18473320	Ceramic 0.047μF
CK17	1	1	1	1	EA10701630	Elect 100μF 16V
CK18	1	1	1	1	EA10701630	Elect 100μF 16V
CK19	1	1	1	1	EA10601630	Elect 10μF 16V
CK20	1	1	1	1	EA10601630	Elect 10μF 16V
CK21	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK22	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK23	1	1	1	1	EA10701630	Elect 100μF 16V
CK24	1	1	1	1	EA10701630	Elect 100μF 16V
CK25	1	1	1	1	DF15472300	Film 4700pF ±5%
CK26	1	1	1	1	DF15472300	Film 4700pF ±5%
CK27	1	1	1	1	DF15272300	Film 2700pF ±5%
CK28	1	1	1	1	DF15272300	Film 2700pF ±5%
CK29	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK30	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK31	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK32	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK33	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK34	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK35	1	1	1	1	EA33405030	Elect 0.33μF 50V
CK36	1	1	1	1	EA33405030	Elect 0.33μF 50V
CK37	1	1	1	1	EA10601630	Elect 10μF 16V
CK38	1	1	1	1	EA10601630	Elect 10μF 16V
CK39	1	1	1	1	EA10601630	Elect 10μF 16V
CK40	1	1	1	1	EA10601630	Elect 10μF 16V
CK43	1	1	1	1	DD15101370	Ceramic 100pF ±5%
CK44	1	1	1	1	DD15101370	Ceramic 100pF ±5%
CK45	1	1	1	1	DF15683350	Film 0.068μF ±5%
CK46	1	1	1	1	DF15683350	Film 0.068μF ±5%
CK47	1	1	1	1	DF15823350	Film 0.082μF ±5%
CK48	1	1	1	1	DF15823350	Film 0.082μF ±5%
CK51	1	1	1	1	DF15103350	Film 0.01μF ±5%

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
CK52	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK57	1	1	1	1	DK18473320	Ceramic 0.047μF
CK58	1	1	1	1	DK18473320	Ceramic 0.047μF
⚠CK59	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CK60	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CK61	1	1	1	1	EA47701630	Elect 470μF 16V
⚠CK62	1	1	1	1	EA47701630	Elect 470μF 16V
⚠CK70	1	1	1	1	EA47601630	Elect 47μF 16V
CL01	1	1	1	1	DF15682300	Film 6800pF ±5%
CL03	1	1	1	1	DF15272300	Film 2700pF ±5%
CL04	1	1	1	1	DF15272300	Film 2700pF ±5%
CL05	1	1	1	1	DF15682550	Film 6800pF ±5%
CL06	1	1	1	1	EA47602530	Elect 47μF 25V
CL07	1	1	1	1	DF15562550	Film 5600pF ±5%
CL08	1	1	1	1	DF15221550	Film 220pF ±5%
CL09	1	1	1	1	DF15221550	Film 220pF ±5%
⚠CL10	1	1	1	1	EA47601630	Elect 47μF 16V
CL13	1	1	1	1	EQ22505030	Elect 2.2 F 50V
CL14	1	1	1	1	EQ22505030	Elect 2.2μF 50V
CL15	1	1	1	1	DF15221550	Film 220pF ±5%
CL16	1	1	1	1	DF15221550	Film 220pF ±5%
CL17	1	1	1	1	DF15221550	Film 220pF ±5%
CL18	1	1	1	1	DF15221550	Film 220pp ±5%
CL19	1	1	1	1	EA10601630	Elect 10μF 16V
CL20	1	1	1	1	EA10601630	Elect 10μF 16V
CL21	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CL22	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CL23	1	1	1	1	EA22601030	Elect 22μF 10V
CL24	1	1	1	1	EA22601030	Elect 22μF 10V
CL25	1	1	1	1	EA10601630	Elect 10μF 16V
CL26	1	1	1	1	EA10601630	Elect 10μF 16V
CL27	1	1	1	1	DF15221550	Film 220pF ±5%
CL28	1	1	1	1	DF15221550	Film 220pF ±5%
CL31	1	1	1	1	DF15104350	Film 0.1μF ±5%
CL32	1	1	1	1	DF15104350	Film 0.1μF ±5%
CQ01	1	1	1	1	DF15472550	Film 4700pF ±5%
CQ02	1	1	1	1	DF15472550	Film 4700pF ±5%
CQ03	1	1	1	1	DK18473320	Ceramic 0.047μF
CQ04	1	1	1	1	DK18473320	Ceramic 0.047μF
CQ05	1	1	1	1	DF15104350	Film 0.1μF ±5%
CQ07	1	1	1	1	EA47601630	Elect 47μF 16V
CQ08	1	1	1	1	EA47601630	Elect 47μF 16V
CQ09	1	1	1	1	DF15473350	Film 0.047μF ±5%
CQ10	1	1	1	1	DF15473350	Film 0.047μF ±5%
CQ11	1	1	1	1	EA47601030	Elect 47μF 10V
CQ12	1	1	1	1	EA47601030	Elect 47μF 10V
CQ13	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CQ14	1	1	1	1	EA47601630	Elect 47μF 16V
CQ15	1	1	1	1	DF15102300	Film 0.001μF ±5%
CQ21	1	1	1	1	DK16103300	Ceramic 0.01μF ±10%
CQ22	1	1	1	1	DK18473320	Ceramic 0.047μF
CQ23	1	1	1	1	EA10800630	Elect 1000μF 6.3V
CQ24	1	1	1	1	EA47502530	Elect 4.7μF 25V
CQ25	1	1	1	1	DK16103300	Ceramic 0.01μF ±10%
CQ26	1	1	1	1	EA22601030	Elect 22μF 10V
CQ27	1	1	1	1	DK16103300	Ceramic 0.01μF ±10%
CQ28	1	1	1	1	EA22601030	Elect 22μF 10V
CQ29	1	1	1	1	DF15334350	Film 0.33μF ±5%
CQ30	1	1	1	1	EA10701030	Elect 100μF 10V
CQ31	1	1	1	1	EA47601030	Elect 47μF 10V

m2415

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
						PQ01-RESISTORS **(All Resistors are ±5% & ¼W)**
RK01	1	1	1	1	GD05103140	10KΩ
RK02	1	1	1	1	GD05103140	10KΩ
RK03	1	1	1	1	GD05223140	22KΩ
RK04	1	1	1	1	GD05223140	22KΩ
RK05	1	1	1	1	GD05223140	22KΩ
RK06	1	1	1	1	GD05223140	22KΩ
RK07	1	1	1	1	GD05472140	4.7KΩ
RK08	1	1	1	1	GD05472140	4.7KΩ
RK09	1	1	1	1	GD05124140	120KΩ
RK10	1	1	1	1	GD05124140	120KΩ
RK11	1	1	1	1	RA05030800	50KΩ, Trimming
RK12	1	1	1	1	RA05030800	50KΩ, Trimming
RK13		1	1	1	GD05333140	33KΩ
RK14		1	1	1	GD05333140	33KΩ
RK15	1	1	1	1	GD05103140	10KΩ
RK16	1	1	1	1	GD05103140	10KΩ
RK17		1	1	1	GD05223140	22KΩ
RK18		1	1	1	GD05223140	22KΩ
RK19	1	1	1	1	GD05562140	5.6KΩ
RK20	1	1	1	1	GD05562140	5.6KΩ
RK21	1	1	1	1	GD05272140	2.7KΩ
RK22	1	1	1	1	GD05272140	2.7KΩ
RK23	1	1	1	1	GD05562140	5.6KΩ
RK24	1	1	1	1	GD05562140	5.6KΩ
RK25	1	1	1	1	GD05103140	10KΩ
RK26	1	1	1	1	GD05103140	10KΩ
RK27	1	1	1	1	GD05123140	12KΩ
RK28	1	1	1	1	GD05123140	12KΩ
RK29	1	1	1	1	GD05822140	8.2KΩ
RK30	1	1	1	1	GD05822140	8.2KΩ
RK31	1	1	1	1	GD05102140	1KΩ
RK32	1	1	1	1	GD05102140	1KΩ
RK33	1	1	1	1	GD05822140	8.2KΩ
RK34	1	1	1	1	GD05822140	8.2KΩ
RK35	1	1	1	1	GD05103140	10KΩ
RK36	1	1	1	1	GD05103140	10KΩ
RK37	1	1	1	1	GD05222140	2.2KΩ
RK38	1	1	1	1	GD05222140	2.2KΩ
RK39	1	1	1	1	GD05123140	12KΩ
RK40	1	1	1	1	GD05123140	12KΩ
RK41	1	1	1	1	GD05153140	15KΩ
RK42	1	1	1	1	GD05153140	15KΩ
RK43	1	1	1	1	GD05473140	47KΩ
RK44	1	1	1	1	GD05473140	47KΩ
RK45	1	1	1	1	GD05681140	680Ω
RK46	1	1	1	1	GD05681140	680Ω
RK47	1	1	1	1	GD05392140	3.9KΩ
RK48	1	1	1	1	GD05392140	3.9KΩ
RK49	1	1	1	1	GD05274140	270KΩ
RK50	1	1	1	1	GD05274140	270KΩ
RK51	1	1	1	1	GD05102140	1KΩ
RK52	1	1	1	1	GD05102140	1KΩ
RK53	1	1	1	1	GD05473140	47KΩ
RK54	1	1	1	1	GD05473140	47KΩ
RK55	1	1	1	1	GD05222140	2.2KΩ
RK56	1	1	1	1	GD05222140	2.2KΩ
RK57	1	1	1	1	GD05822140	8.2KΩ
RK58	1	1	1	1	GD05822140	8.2KΩ
RK59	1	1	1	1	GD05102140	1KΩ
RK60	1	1	1	1	GD05102140	1KΩ
RK61	1	1	1	1	GD05681140	680Ω
RK62	1	1	1	1	GD05681140	680Ω

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
RK63	1	1	1	1	GD05271140	270Ω
RK64	1	1	1	1	GD05271140	270Ω
RK65	1	1	1	1	GD05182140	1.8KΩ
RK66	1	1	1	1	GD05182140	1.8KΩ
RK67	1	1	1	1	GD05103140	10KΩ
RK68	1	1	1	1	GD05103140	10KΩ
RK69	1	1	1	1	GD05153140	15KΩ
RK70	1	1	1	1	GD05153140	15KΩ
RK71	1	1	1	1	GD05153140	15KΩ
RK72	1	1	1	1	GD05153140	15KΩ
RK73	1	1	1	1	GD05153140	15KΩ
RK74	1	1	1	1	GD05153140	15KΩ
RK75	1	1	1	1	RA02030800	20KΩ, Trimming
RK76	1	1	1	1	RA02030800	20KΩ, Trimming
RK77	1	1	1	1	RA01030800	10KΩ, Trimming
RK78	1	1	1	1	RA01030800	10KΩ, Trimming
RK79	1	1	1	1	GD05821140	820Ω
RK80	1	1	1	1	GD05821140	820Ω
⚠RK81	1	1	1	1	GA05181010	180Ω 1W
⚠RK82	1	1	1	1	GA05181010	180Ω 1W
RK83	1	1	1	1	GD05333140	33KΩ
RK84	1	1	1	1	GD05333140	33KΩ
RL01	1	1	1	1	GD05333140	33KΩ
RL02	1	1	1	1	GD05333140	33KΩ
RL03	1	1	1	1	GD05100140	10Ω
RL04	1	1	1	1	GD05100140	10Ω
RL05	1	1	1	1	GD05472140	4.7KΩ
RL06	1	1	1	1	GD05472140	4.7KΩ
RL07	1	1	1	1	GD05103140	10KΩ
RL08	1	1	1	1	GD05103140	10KΩ
RL09	1	1	1	1	GD05103140	10KΩ
RL10	1	1	1	1	GD05103140	10KΩ
RL11	1	1	1	1	GD05102140	1KΩ
RL12	1	1	1	1	GD05102140	1KΩ
RL13	1	1	1	1	GD05102140	1KΩ
RL14	1	1	1	1	GD05102140	1KΩ
RL15	1	1	1	1	GD05100140	10KΩ
RL16	1	1	1	1	GD05100140	10KΩ
RL17	1	1	1	1	GD05153140	15KΩ
RL18	1	1	1	1	GD05153140	15KΩ
RL19	1	1	1	1	GD05153140	15KΩ
RL20	1	1	1	1	GD05153140	15KΩ
RL21	1	1	1	1	GD05182140	1.8KΩ
RL22	1	1	1	1	GD05182140	1.8KΩ
RL23	1	1	1	1	GD05392140	3.9KΩ
RL24	1	1	1	1	GD05392140	3.9KΩ
RL25	1	1	1	1	GD05332140	3.3KΩ
RL26	1	1	1	1	GD05332140	3.3KΩ
RL27	1	1	1	1	GD05103140	10KΩ
RL28	1	1	1	1	GD05103140	10KΩ
RL29	1	1	1	1	GD05104140	100KΩ
RL30	1	1	1	1	GD05104140	100KΩ
RL31	1	1	1	1	GD05153140	15KΩ
RL32	1	1	1	1	GD05153140	15KΩ
RL33	1	1	1	1	GD05103140	10KΩ
RL34	1	1	1	1	GD05103140	10KΩ
RL35	1	1	1	1	GD05331140	330Ω
RL36	1	1	1	1	GD05331140	330Ω
RL37	1	1	1	1	GD05103140	10KΩ
RL38	1	1	1	1	GD05103140	10KΩ
RL39	1	1	1	1	GD05473140	47KΩ
RL40	1	1	1	1	GD05473140	47KΩ

m2416

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
RL41	1	1	1	1	GD05103140	10KΩ
RL42	1	1	1	1	GD05103140	10KΩ
RL44	1	1	1	1	GD05103140	10KΩ
RL45	1	1	1	1	GD05103140	10KΩ
RL46	1	1	1	1	GD05103140	10KΩ
RL47	1	1	1	1	GD05822140	8.2KΩ
RL48	1	1	1	1	GD05822140	8.2KΩ
RL49	1	1	1	1	GD05102140	1KΩ
RL50	1	1	1	1	GD05102140	1KΩ
RL51	1	1	1	1	GD05102140	1KΩ
RL52	1	1	1	1	GD05272140	2.7KΩ
RL53	1	1	1	1	GD05332140	3.3KΩ
RL54	1	1	1	1	GD05332140	3.3KΩ
RL55	1	1	1	1	GD05153140	15KΩ
RL56	1	1	1	1	GD05153140	15KΩ
RL57	1	1	1	1	GD05153140	15KΩ
RL58	1	1	1	1	GD05153140	15KΩ
RL59	1	1	1	1	RA05010800	500Ω, Trimming
RL60	1	1	1	1	RA05010800	500Ω, Trimming
RL61	1	1	1	1	GD05224140	220KΩ
RL62	1	1	1	1	GD05224140	220KΩ
RL63	1	1	1	1	GD05102140	1KΩ
RL64	1	1	1	1	GD05102140	1KΩ
RL65	1	1	1	1	GD05104140	100KΩ
RL66	1	1	1	1	GD05104140	100KΩ
RL67	1	1	1	1	GD05103140	10KΩ
RL68	1	1	1	1	GD05153140	15KΩ
RL69	1	1	1	1	GD05821140	820Ω
RL70	1	1	1	1	GD05821140	820Ω
RL71	1	1	1	1	GD05102140	1KΩ
RL72	1	1	1	1	GD05332140	3.3KΩ
RQ01	1	1	1	1	GD05104140	100KΩ
RQ02	1	1	1	1	GD05823140	82KΩ
RQ03	1	1	1	1	GD05103140	10KΩ
RQ04	1	1	1	1	GD05222140	2.2KΩ
RQ05	1	1	1	1	GD05103140	10KΩ
RQ06	1	1	1	1	GD05224140	220KΩ
RQ07	1	1	1	1	GD05472140	4.7KΩ
RQ08	1	1	1	1	GD05472140	4.7KΩ
RQ09	1	1	1	1	GD05180140	18Ω
RQ10	1	1	1	1	GD05151140	150Ω
RQ11	1	1	1	1	GD05102140	1KΩ
RQ12	1	1	1	1	GD05102140	1KΩ
RQ13	1	1	1	1	GD05103140	10KΩ
RQ14	1	1	1	1	GD05103140	10KΩ
RQ15	1	1	1	1	GD05224140	220KΩ
RQ16	1	1	1	1	GD05152140	1.5KΩ
RQ17	1	1	1	1	GD05103140	10KΩ
RQ18	1	1	1	1	RA01030800	10KΩ, Trimming
RQ19	1	1	1	1	GD05101140	100Ω
RQ20	1	1	1	1	GD05270140	27Ω
RQ21	1	1	1	1	GD05224140	220KΩ
RQ22	1	1	1	1	GD05224140	220KΩ
RQ23	1	1	1	1	GD05224140	220KΩ
RQ24	1	1	1	1	GD05224140	220KΩ
RQ25	1	1	1	1	GD05224140	220KΩ
RQ26	1	1	1	1	GD05224140	220KΩ
RQ27	1	1	1	1	GD05471140	470Ω
RQ28	1	1	1	1	GD05471140	470Ω
RQ29	1	1	1	1	GD05104140	100KΩ
RQ30	1	1	1	1	GD05104140	100KΩ

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
RQ31	1	1	1	1	GD05470140	47Ω
RQ32	1	1	1	1	GD05470140	47Ω
RQ33	1	1	1	1	GD05103140	10KΩ
RQ34	1	1	1	1	GD05103140	10KΩ
RQ35	1	1	1	1	GD05104140	100KΩ
RQ36	1	1	1	1	GD05104140	100KΩ
RQ37	1	1	1	1	GD05103140	10KΩ
RQ38	1	1	1	1	GD05103140	10KΩ
RQ39	1	1	1	1	GD05104140	100KΩ
RQ40	1	1	1	1	GD05103140	10KΩ
RQ41	1	1	1	1	GD05104140	100KΩ
RQ42	1	1	1	1	GD05472140	4.7KΩ
RQ43	1	1	1	1	GD05333140	33KΩ
RQ44	1	1	1	1	GD05393140	39KΩ
RQ45	1	1	1	1	GD05224140	220KΩ
RQ46	1	1	1	1	GD05102140	1KΩ
RQ47	1	1	1	1	GD05100140	10Ω
RQ48	1	1	1	1	GD05222140	2.2KΩ
RQ49	1	1	1	1	GD05223140	22KΩ
RQ50	1	1	1	1	GD05683140	68KΩ
RQ51	1	1	1	1	GD05472140	4.7KΩ
RQ52	1	1	1	1	GD05472140	4.7KΩ
RQ53	1	1	1	1	GD05102140	1KΩ
RQ54	1	1	1	1	GD05102140	1KΩ
RQ55	1	1	1	1	GD05102140	1KΩ
RQ56	1	1	1	1	GD05102140	1KΩ
RQ57	1	1	1	1	GD05682140	6.8KΩ
RQ58	1	1	1	1	GD05682140	6.8KΩ
RQ59	1	1	1	1	GD05332140	3.3KΩ
RQ60	1	1	1	1	GD05332140	3.3KΩ
RQ61	1	1	1	1	GD05103140	10KΩ
RQ62	1	1	1	1	GD05103140	10KΩ
RQ63	1	1	1	1	GD05473140	47KΩ
RQ64	1	1	1	1	GD05103140	10KΩ
RQ65	1	1	1	1	GD05103140	10KΩ
RQ66	1	1	1	1	GD05103140	10KΩ
RQ67	1	1	1	1	GD05103140	10KΩ
RQ68	1	1	1	1	GD05271140	270Ω
RQ69	1	1	1	1	GD05271140	270Ω
RQ70	1	1	1	1	GD05271140	270Ω
RQ71	1	1	1	1	GD05103140	10KΩ
RQ73	1	1	1	1	GD05273140	27KΩ
RQ74	1	1	1	1	GD05104140	100KΩ
RQ75	1	1	1	1	GD05103140	10KΩ
RQ76	1	1	1	1	GD05103140	10KΩ
RQ77	1	1	1	1	GD05682140	6.8KΩ
RQ78	1	1	1	1	GD05682140	6.8KΩ
RQ79	1	1	1	1	GD05153140	15KΩ
RQ80	1	1	1	1	GD05153140	15KΩ
RQ81	1	1	1	1	GD05393140	39KΩ
RQ82	1	1	1	1	GD05103140	10KΩ
RQ83	1	1	1	1	GD05152140	1.5KΩ
RQ84	1	1	1	1	GD05222140	2.2KΩ
RQ85	1	1	1	1	GD05473140	47KΩ
⚠RQ86	1	1	1	1	GA05181010	180Ω 1W
⚠RQ87	1	1	1	1	GA05181010	180Ω 1W
⚠RQ88	1	1	1	1	GG05330120	33Ω ½W
RQ89	1	1	1	1	GD05103140	10KΩ
RQ90	1	1	1	1	GD05472140	4.7KΩ
RQ91	1	1	1	1	GD05473140	47KΩ

M2417

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
RQ92	1	1	1	1	GD05473140	47KΩ
RQ93	1	1	1	1	GD05473140	47KΩ
RQ94	1	1	1	1	GD05392140	3.9KΩ
RQ95	1	1	1	1	GD05102140	1KΩ
RQ96	1	1	1	1	GD05102140	1KΩ
RQ97	1	1	1	1	GD05335140	3.3MΩ
RQ98	1	1	1	1	GD05335140	3.3MΩ
RQ99	1	1	1	1	GD05335140	3.3MΩ
RR03	1	1	1	1	GD05103140	10KΩ
RR04	1	1	1	1	GD05103140	10KΩ
						PQ01-SEMICONDUCTORS
DK01	1	1	1	1	HD20001000	Diode 1S1555
DK02	1	1	1	1	HD20001000	Diode 1S1555
DL01 ~ DL06	6	6	6	6	HD20001000	Diode 1S1555
DL51	1	1	1	1	HD30049060	Zener RD13EB2
DQ01	1	1	1	1	HD30035010	Zener HZ2B1
DQ02	1	1	1	1	HD30035060	Zener RD3.6E-B2
DQ03	1	1	1	1	HD30035060	Zener RD3.6E-B2
DQ04 ~ DQ15	12	12	12	12	HD20001000	Diode 1S1555
DQ16	1	1	1	1	HD20003020	Diode MA150
DQ17	1	1	1	1	HD20001000	Diode 1S1555
DQ18	1	1	1	1	HD20003020	Diode MA150
DQ19	1	1	1	1	HD20003020	Diode MA150
DQ20	1	1	1	1	HD10004020	Diode OA91
DQ21	1	1	1	1	HD30004020	Zener MA1051M
DQ22	1	1	1	1	HD20001000	Diode 1S1555
DQ23	1	1	1	1	HD20001000	Diode 1S1555
⚠DQ24	1	1	1	1	HD30045060	Zener RD9.1E-B3
DQ25	1	1	1	1	HD30045060	Zener RD9.1E-B3
QK01	1	1	1	1	HC10052010	IC HA12020
QK02	1	1	1	1	HC10052010	IC HA12020
QK11	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QK12	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QK13	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
QK14	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
QK15	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QK16	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QK17	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QK18	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QK19	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QK20	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QL01	1	1	1	1	HC10082050	IC TA7325P
QL02	1	1	1	1	HC10003090	IC NJM4558D
QL03	1	1	1	1	HC10135030	IC LA6324
QL07	1	1	1	1	HW40001500	Photo Unit P1501
QL08	1	1	1	1	HW40001500	Photo Unit P1501
QL11	1	1	1	1	HT313841S0	Transistor 2SC1384(S)
QL12	1	1	1	1	HT313841S0	Transistor 2SC1384(S)
QL13	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL14	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL15	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL16	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL17	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL18	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL19	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL51	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL52	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL53	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QL54	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)

M2418

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
QQ01	1	1	1	1	HC10101030	IC LC6502C
QQ02	1	1	1	1	HC736700A0	IC 74LS367A
QQ03	1	1	1	1	HC10007090	IC NJM4560D
QQ04	1	1	1	1	HC10003090	IC NJM4558D
QQ05	1	1	1	1	HC10021370	IC MC3403N
QQ11	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
QQ12	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
QQ13	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QQ14	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QQ15	1	1	1	1	HT326342A0	Transistor 2SC2634(R, S)
QQ16 ~ QQ25	10	10	10	10	HT308282A0	Transistor 2SC828(R, S)
QQ26	1	1	1	1	HT107332A0	Transistor 2SA733(P, Q)
QQ27	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QQ28	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
QQ29	1	1	1	1	HT320621C0	Transistor 2SC2062(S)
QQ30	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
						PQ01-MISCELLANEOUS
JL01	1	1	1	1	YP06002400	Plug, (4P)
JL02	1	1	1	1	YP06002360	Plug, (3P)
JQ01	1	1	1	1	YP06003160	Plug, (10P)
JQ02	1	1	1	1	YJ06002440	Jack, (4P)
JQ03	1	1	1	1	YJ06002440	Jack, (4P)
LK01	1	1	1	1	LC22260600	Choke Coil, 22mH
LK02	1	1	1	1	LC22260600	Choke Coil, 22mH
LK03	1	1	1	1	LC22260600	Choke Coil, 22mH
LK04	1	1	1	1	LC22260600	Choke Coil, 22mH
LK05	1	1	1	1	LC24750600	Choke Coil, 4.7mH
LK06	1	1	1	1	LC24750600	Choke Coil, 4.7mH
LL01	1	1	1	1	TC10140190	OSC Transformer, 105kHz
SQ01	1	1	1	1	SS01020410	Slide Switch
WQ01	1	1	1	1	YU05100260	Jumper Lead, (5P)
WQ02	1	1	1	1	YU08100260	Jumper Lead, (8P)
WQ03	1	1	1	1	YU08100260	Jumper Lead, (8P)
WQ04	1	1	1	1	YU04340260	Jumper Lead, (4P)
WQ05	1	1	1	1	YU04480260	Jumper Lead, (4P)
WQ06	1	1	1	1	YU04500260	Jumper Lead, (4P)
WQ07	1	1	1	1	YU03100260	Jumper Lead, (3P)
WQ08	1	1	1	1	YU03100260	Jumper Lead, (3P)
ZQ01	1	1	1	1	ZB09010010	Battery
						PQ02-AUTO BIAS KEY SW. CIRCUIT BOARD
PQ02	1	1	1	1	YK132T2320	P.W. Board, Auto Bias Key SW.
	1	1	1		ZZ132T2320	P.W. Board Assembly
RQ72	1	1	1	1	GD05472140	Resistor 4.7KΩ ±5% ¼W
DQ92	1	1	1	1	HI10037020	L.E.D. LN322GP
DQ93	1	1	1	1	HI10037020	L.E.D. LN322GP
DQ94	1	1	1	1	HI10025020	L.E.D. LN222RP
SQ91	1	1	1	1	SP01010580	Push Switch, Auto
SQ92	1	1	1	1	SP01010580	Push Switch, Start
SQ93	1	1	1	1	SP01010580	Push Switch, Reset

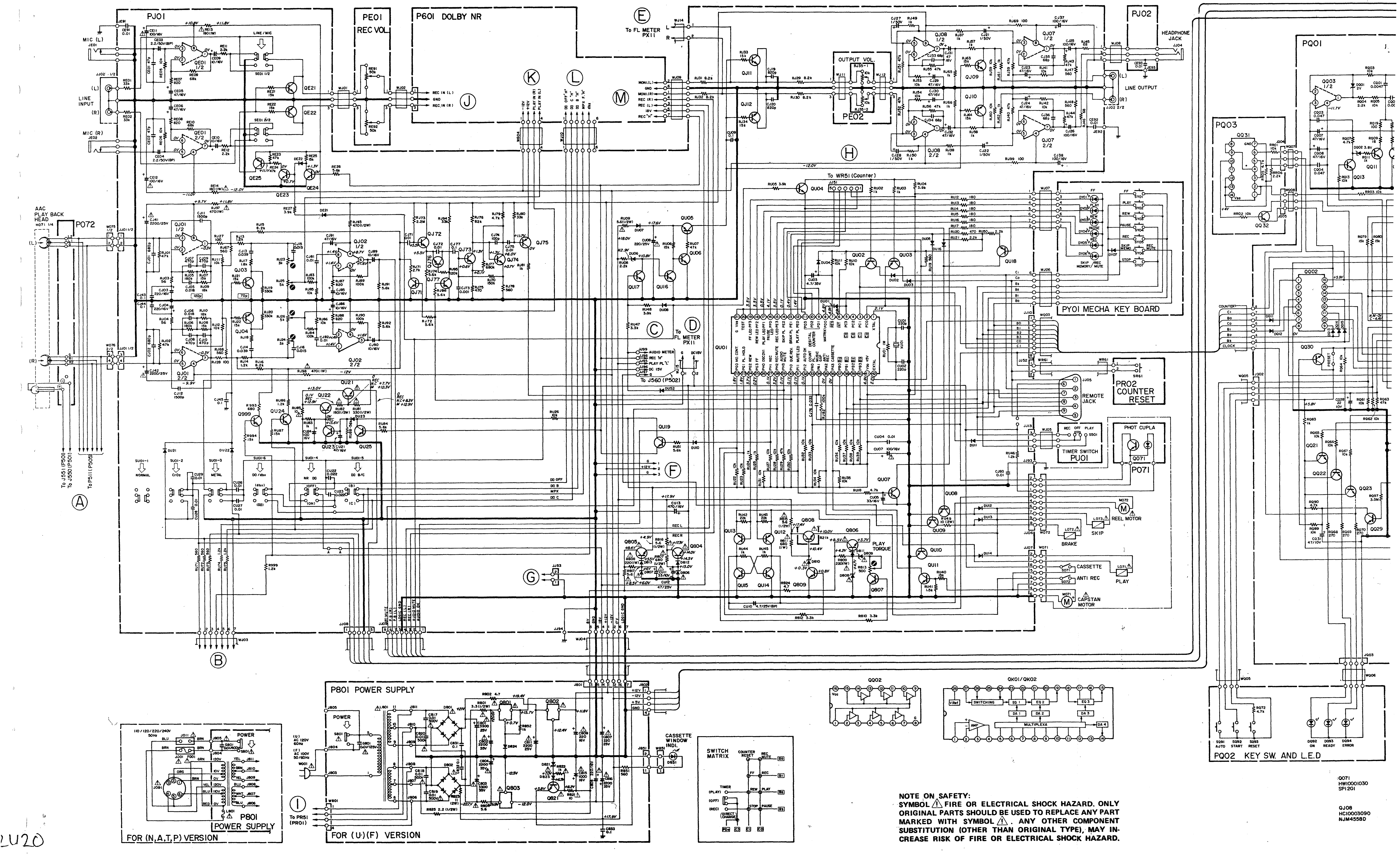
REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
						PQ03-AUTO BIAS SUB CIRCUIT BOARD
PQ03	1	1	1	1	YK132T2330	P.W. Board, Auto Bias Sub
	1	1	1		ZZ132T2330	P.W. Board Assembly
RR01	1	1	1	1	GD05103140	Resistor 10KΩ ±5% ¼W
RR02	1	1	1	1	GD05103140	Resistor 10KΩ ±5% ¼W
RR05	1	1	1	1	GD05472140	Resistor 4.7KΩ ±5% ¼W
RR06	1	1	1	1	GD05222140	Resistor 2.2KΩ ±5% ¼W
QQ31	1	1	1	1	HC401100B0	IC CD4011BE
QQ32	1	1	1	1	HT308282A0	Transistor 2SC828(R, S)
JQ04	1	1	1	1	YJ06002430	Jack, (3P)
JQ05	1	1	1	1	YJ06002530	Jack, (3P)
						PR01-TAPE COUNTER CIRCUIT BOARD
PR01	1	1	1	1	YK156T1950	P.W. Board, Tape Counter
	1	1	1		ZZ156T1950	P.W. Board Assembly
						PR01-CAPACITORS
CR51	1	1	1	1	EA10601630	Elect 10μF 16V
CR62	1	1	1	1	EA22703530	Elect 220μF 35V
CR63	1	1	1	1	EA10702530	Elect 100μF 25V
						PR01-RESISTORS (All Resistors are ±5% & ¼W)
RR00	7	7	7	7	GD05000140	0Ω, Jumper
RR52	1	1	1	1	GD05103140	10KΩ
RR53	1	1	1	1	GD05472140	4.7KΩ
RR54	1	1	1	1	GD05103140	10KΩ
RR55	1	1	1	1	GD05332140	3.3KΩ
RR61	1	1	1	1	NF02100140	10Ω ±2%
RR62	1	1	1	1	NK05121120	120Ω ½W
GR51	1	1	1	1	BW05104010	100KΩ x 3, Compo.
						PR01-SEMICONDUCTORS
QR51	1	1	1	1	HC409400B0	IC 4094B
QR52	1	1	1	1	HC454300B0	IC 4543B
QR53	1	1	1	1	HC10131030	IC LB1292
QR54	1	1	1	1	HC10131030	IC LB1292
QR55	1	1	1	1	HT333112B0	Transistor 2SC331(R, S)
QR61	1	1	1	1	HE20002030	Diode DBB10B
QR62	1	1	1	1	HC38520090	IC NJM78M20A
						PR01-MISCELLANEOUS
PR51	1	1	1	1	YP06002640	Plug, (4P)
VR51	1	1	1	1	HQ30303410	Display Unit
WR51	1	1	1	1	YU05360260	Jumper Lead, (5P)
WR52	1	1	1	1	YU03100260	Jumper Lead, (3P)
						PR02-COUNTER RESET SW. CIRCUIT BOARD
PR02	1	1	1	1	YK156T1960	P.W. Board, Counter Reset SW.
	1	1	1		ZZ156T1960	P.W. Board Assembly
SR61	1	1	1	1	SP01010580	Push Switch, Reset
WR61	1	1	1	1	YU02400260	Jumper Lead, (2P)

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	F		
						PU01-TIMER SWITCH CIRCUIT BOARD
PU01	1	1	1	1	YK132T1760	P.W. Board Timer Switch
	1	1	1		ZZ132T1760	P.W. Board Assembly
S501	1	1	1	1	SS02030190	Slide Switch, 2-3
						PX01-FL METER CIRCUIT BOARD
PX01	1	1	1	1	YK156T1970	P.W. Board, FL Meter
	1	1	1		ZZ156T1970	P.W. Board Assembly
						PX01-CAPACITORS
CX01	1	1	1	1	EA22505030	Elect 2.2μF 50V
CX02	1	1	1	1	EA22505030	Elect 2.2μF 50V
CX03	1	1	1	1	EA10602530	Elect 10μF 25V
CX04	1	1	1	1	EA10602530	Elect 10μF 25V
						PX01-RESISTORS
RX01	1	1	1	1	RA04730600	47KΩ, Trimming (L)
RX02	1	1	1	1	RA04730600	47KΩ, Trimming (R)
RX11	1	1	1	1	RF05100120	10Ω ±5% ½W, Fusible
RX12	1	1	1	1	NK05121030	120Ω ±5% 3W
GX01	1	1	1	1	BW05103020	10KΩ x 4, Compo.
						PX01-SEMICONDUCTORS
QX01	1	1	1	1	HC10037210	IC BA6146
QX02	1	1	1	1	HC10037210	IC BA6146
						PX01-MISCELLANEOUS
MX01	1	1	1	1	HQ31201410	Display Unit
PX11	1	1	1	1	YJ06002440	Jack, (4P)
PX12	1	1	1	1	YJ06002430	Jack, (3P)
						PY01-KEY SWITCH CIRCUIT BOARD
PY01	1	1	1	1	YK132T1730	P.W. Board, Key Switch
	1	1	1		ZZ132T1730	P.W. Board Assembly
DY01	1	1	1	1	HI10035020	L.E.D. LN38GP, FF
DY02	1	1	1	1	HI10035020	L.E.D. LN38GP, PLAY
DY03	1	1	1	1	HI10035020	L.E.D. LN38GP, REW
DY04	1	1	1	1	HI10036020	L.E.D. LN48YP, PAUSE
DY05	1	1	1	1	HI10022020	L.E.D. LN28RP, REC
DY06	1	1	1	1	HI10022020	L.E.D. LN28RP, Mute/Skip
DY07	1	1	1	1	HD20001000	Diode 1S1555
SY01	1	1	1	1	SP01010580	Push Switch, FF
SY02	1	1	1	1	SP01010580	Push Switch, PLAY
SY03	1	1	1	1	SP01010580	Push Switch, REW
SY04	1	1	1	1	SP01010580	Push Switch, PAUSE
SY05	1	1	1	1	SP01010580	Push Switch, REC
SY06	1	1	1	1	SP01010580	Push Switch, MUTE/SKIP-M
SY07	1	1	1	1	SP01010580	Push Switch, STOP

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

NOTE ON SAFETY:
SYMBOL ⚠ FIRE OR ELECTRICAL SHOCK HAZARD. ONLY ORIGINAL PARTS SHOULD BE USED TO REPLACE ANY PART MARKED WITH SYMBOL ⚠. ANY OTHER COMPONENT SUBSTITUTION (OTHER THAN ORIGINAL TYPE), MAY INCREASE RISK OF FIRE OR ELECTRICAL SHOCK HAZARD.

M2419


PJ01
PE01 REC VOL
P601 DOLBY NR
To FL METER PX11
PJ02
HEADPHONE JACK
PQ01
MIC (L)
LINE INPUT
MIC (R)
LINE/MIC
OUTPUT VOL.
PE02
LINE OUTPUT
AAC PLAY BACK HEAD
P072
PQ03
To WR51 (Counter)
PY01 MECHA KEY BOARD
QU01
To J560 (P5021)
PR02 COUNTER RESET
REMOTE JACK
TIMER SWITCH PU01
PHOT CUPLA
P071
REEL MOTOR
SKIP
BRAKE
CASSETTE
ANTI REC
PLAY
CAPSTAN MOTOR
PLAY TORQUE
P801 POWER SUPPLY
POWER
CASSETTE WINDOW INDI.
To PR51 (PR01)
FOR (U)(F) VERSION
P801 POWER SUPPLY
FOR (N,A,T,P) VERSION
SWITCH MATRIX
QQ02
QK01/QK02
PQ02 KEY SW. AND L.E.D
SQ91 AUTO
SQ92 START
SQ93 RESET
DQ92 ON
DQ93 READY
DQ94 ERROR
A
B
C
D
E
F
G
H
I
J
K
L
M

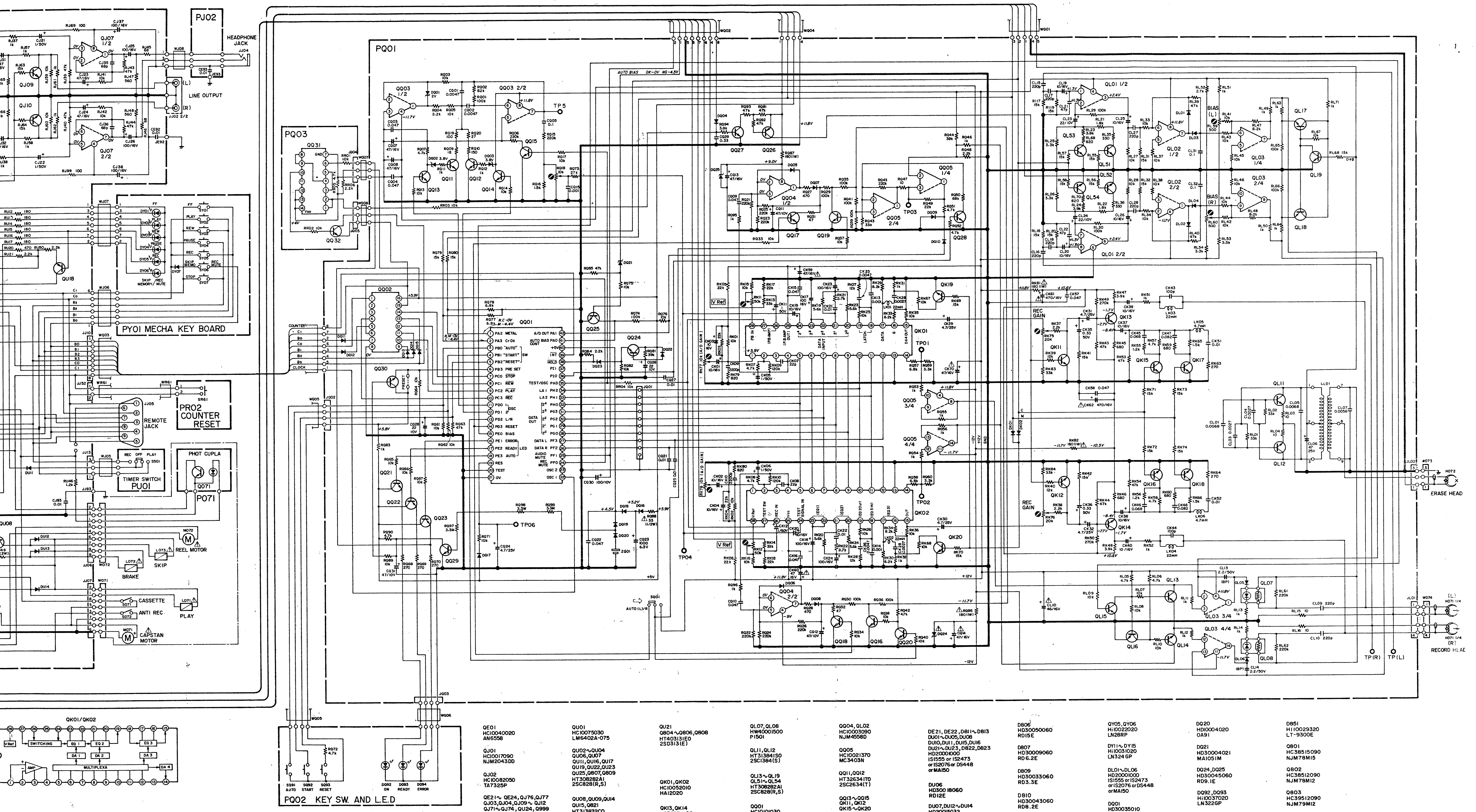
NOTE ON SAFETY:
SYMBOL ⚠ FIRE OR ELECTRICAL SHOCK HAZARD. ONLY ORIGINAL PARTS SHOULD BE USED TO REPLACE ANY PART MARKED WITH SYMBOL ⚠. ANY OTHER COMPONENT SUBSTITUTION (OTHER THAN ORIGINAL TYPE), MAY INCREASE RISK OF FIRE OR ELECTRICAL SHOCK HAZARD.

Q071
HW10001030
SP1201

QJ08
HC10003090
NJM4558D

LU20

model SD930


PJ02
HEADPHONE JACK
LINE OUTPUT
PQ01
PQ03
PY01 MECHA KEY BOARD
PR02 COUNTER RESET
REMOTE JACK
TIMER SWITCH
PU01
PHOT CUPLA
P071
REEL MOTOR
BRAKE
SKIP
CASSETTE
ANTI REC
PLAY
CAPSTAN MOTOR
QK01/QK02
SWITCHING
MULTIPLEXA
AMP
PQ02 KEY SW. AND L.E.D
AUTO
START
RESET
ON
READY
ERROR
REC GAIN
BIAS (L)
BIAS (R)
ERASE HEAD
RECORD HEAD
TP(R)
TP(L)

Q071
HW10001030
SP1201

QJ08
HC10003090
NJM4558D

QE01
HC10040020
AN6558

QJ01
HC10017090
NJM2043DD

QJ02
HC10082050
TA7325P

QE21∿ QE24, QJ76, QJ77
QJ03, QJ04, QJ09∿ QJ12
QJ71∿QJ74, QU24, Q999
HT326342A1
2SC2634(R,S)

QJ07
HC10016090
NJM4556D

QJ75, QE25
QU05, QU18
HT107332A1
2SA733(P,Q)

QU01
HC10075030
LM6402A-075

QU02∿QU04
QU06, QU07
QU11, QU16, QU17
QU19, QU22, QU23
QU25, Q807, Q809
HT308282A1
2SC828(R,S)

QU08, QU09, QU14
QU15, Q821
HT313832C0
2SC1383(R,S)

QU10
HT40894000
2SD894

QU12, QU13
HT106832C0
2SA683(R,S)

QU21
Q804∿Q806, Q808
HT403131E0
2SD313(E)

QK01, QK02
HC10052010
HA12020

QK13, QK14
HT326341S0
2SC2634(S)

QL01
HC10082050
TA7325P

QL03
HC10135030
LA6324

QL07, QL08
HW40001500
P1501

QL11, QL12
HT313841S0
2SC1384(S)

QL13∿QL19
QL51∿QL54
HT308282A1
2SC828(R,S)

QQ01
HC10101030
LC6502C

QQ02
HC736700A0
74LS367A

QQ03
HC10007090
NJM4560D

QQ04, QL02
HC10003090
NJM4558D

QQ05
HC10021370
MC3403N

QQ11, QQ12
HT326341T0
2SC2634(T)

QQ13∿QQ15
QK11, QK12
QK15∿QK20
HT326342A1
2SC2634(R,S)

QQ16∿QQ25
QQ27, QQ28, QQ30, QQ32
HT308282A1
2SC828(R,S)

QQ26
HT107332A0
2SA733(P,Q)

DE21, DE22, D811∿D813
DU01∿DU05, DU08
DU10, DU11, DU15, DU16
DU21∿DU23, D822, D823
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DU06
HD30018060
RD12E

DU07, DU12∿DU14
HD20015032
DS135D

D801, D802
HD20027080
RB152

D808
HD30064060
RD6.2EB2

D806
HD30050060
RD15E

D807
HD30009060
RD6.2E

D809
HD30033060
RD3.3E

D810
HD30043060
RD8.2E

D821
HD30021020
MA1068M

DY01 ∿ DY03
Hi10035020
LN38GP

DY04
Hi10036020
LN48YP

QY05, QY06
Hi10022020
LN28RP

DY11∿ DY15
Hi10031020
LN324GP

DL01∿DL06
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DQ01
HD30035010
HZ2B1

DQ02, DQ03
HD30035060
RD3.6EB

DQ04∿DQ15
DQ17, DQ22, DQ23
DK01, DK02
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DQ20
HD10004020
OA91

DQ21
HD30004021
MA1051M

DQ24, DQ25
HD30045060
RD9.1E

DQ92, DQ93
Hi10037020
LN322GP

DQ94
Hi10025020
LN222RP

QQ29
HT320621C0
2SC2062(C)

QQ31
HC401100B0
HD14011BP

D851
H110029320
LT-9300E

Q801
HC38515090
NJM78M15

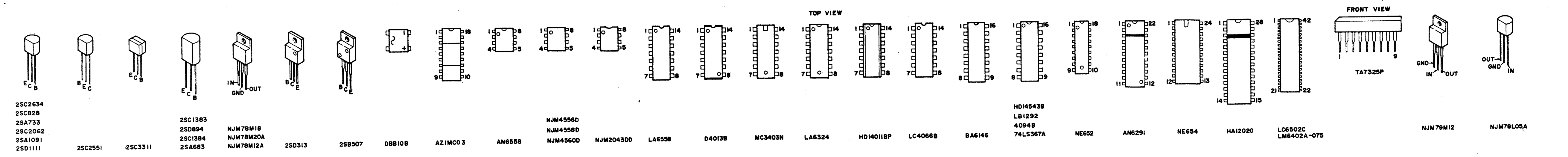
Q802
HC38512090
NJM78M12

Q803
HC39512090
NJM79M12

AFETY:

FIRE OR ELECTRICAL SHOCK HAZARD. ONLY ARTS SHOULD BE USED TO REPLACE ANY PART ITH SYMBOL ⚠. ANY OTHER COMPONENT ON (OTHER THAN ORIGINAL TYPE), MAY IN- SK OF FIRE OR ELECTRICAL SHOCK HAZARD.

Components and wiring are subject to change for modification without notice.


TOP VIEW
FRONT VIEW
2SC2634
2SC828
2SA733
2SC2062
2SA1091
2SD1111
2SC2551
2SC3311
2SC1383
2SD894
2SC1384
2SA683
NJM78M18
NJM78M20A
NJM78M12A
2SD313
2SB507
DBB10B
AZIMC03
AN6558
NJM4556D
NJM4558D
NJM4560D
NJM2043DD
LA6558
D4013B
MC3403N
LA6324
HD14011BP
LC4066B
BA6146
HD14543B
LB1292
4094B
74LS367A
NE652
AN6291
NE654
HA12020
LC6502C
LM6402A-075
TA7325P
NJM79M12
NJM78L05A
IN
GND
OUT

Q500
HC10001520
AZIMC03

D556
HD30004020
MA1051M

Q501, Q502
HC10017090
NJM2043D-D

D571, D572
D574, D575
H110024320
GL-5HY10

Q503, Q504
HC10003090
NJM4558D

D573
H110022320
GL-5NG10

Q512∼Q514
Q508, Q509
Q548, Q549, Q576
HT326342A1
2SC2634 (R,S)

Q510, Q552
HC38512090
NJM78M12A

QR51
HC40940080
4094B

Q511
HC40130080
D4013

QR52
HC45430080
4543B

Q541, Q542
HT110911B0
2SA1091(0)

QR53, QR54
HC10131030
LB1292

Q543, Q544
HT325511B0
2SC2551(0)

QR55
HT333112B1
2SC3311

Q545, Q546
HT411111A0
2SD1111

QR61
HE20002030
DBB10B

Q547
HT313832A0
2SC1383(R,Q)

QR62
HC38520090
NJM78M20A

Q553
HC38105090
NJM78L05A

Q571
HC10040020
AN6558

QX01, QX02
HC10037210
BA6146

Q574, Q575
HC10135030
LA6558

D501
HV00001540
BZW06-128B

DY11, DY12, DY16
H110055020
LN840CP

D541∼D546
HD20020016
1SS82

DY13∼DY15
H110054020
LN340CP

D557∼D560
D548∼D550
D552∼D555
HD20001210
1S2473C

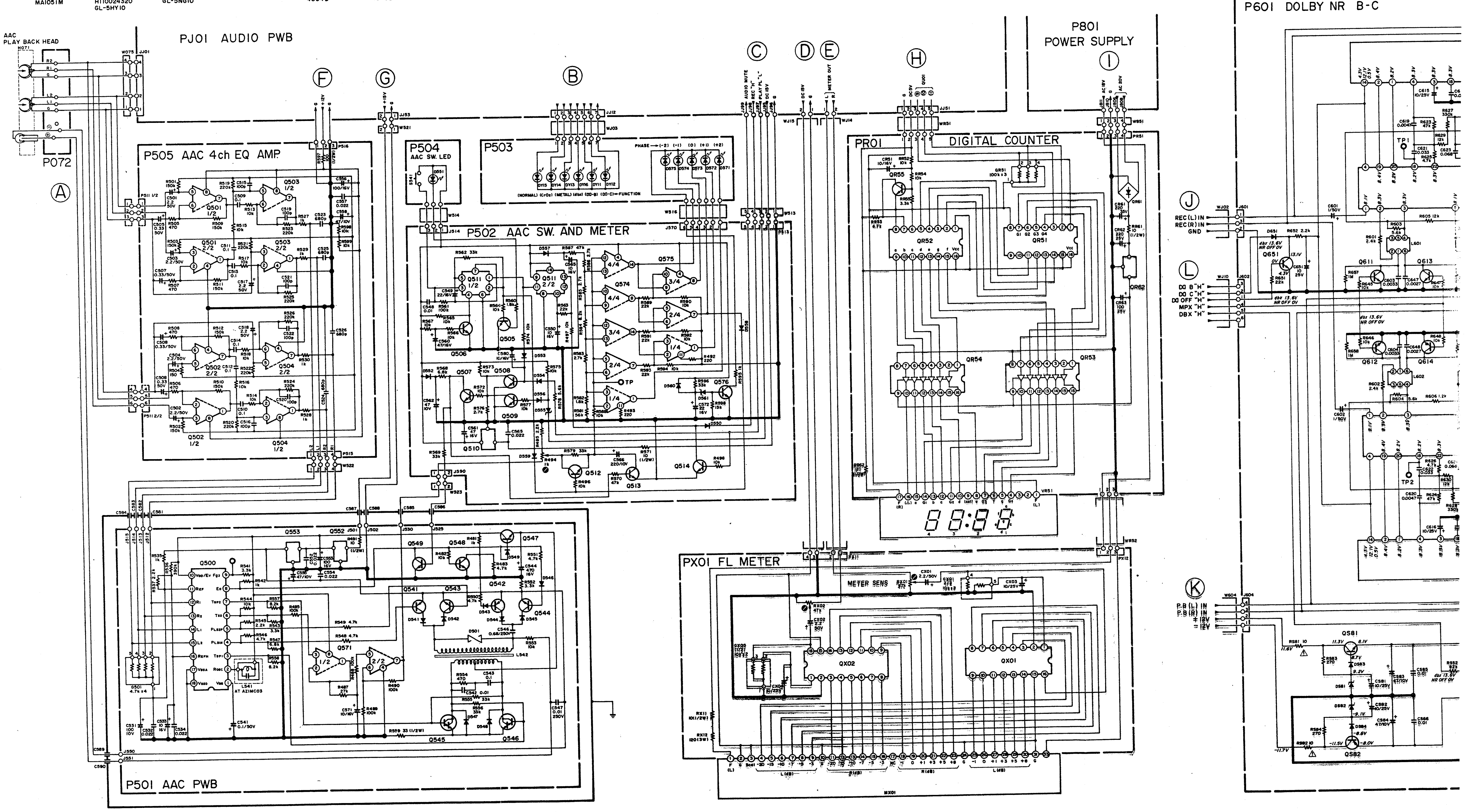
D561
HD30007020
MA1091M

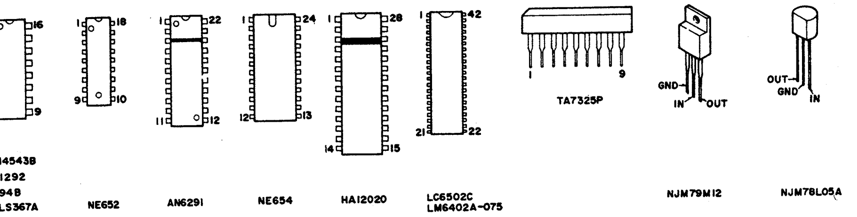
D551
H110049020
LN422YP

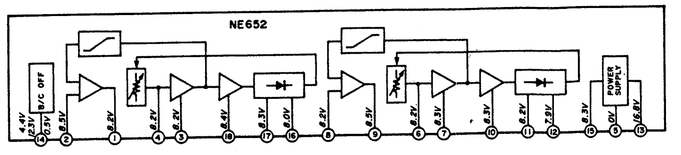
Q601, Q602
HC10012270
NE652

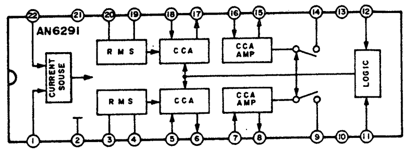
Q603, Q604
HC10013270
NE654

Q651, Q652, Q653, Q611∼Q614
HT326342A1
2SC2634(R,S)


AAC
PLAY BACK HEAD
P072
Ⓐ
PJ01 AUDIO PWB
Ⓕ
Ⓖ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Ⓗ
P801
POWER SUPPLY
Ⓘ
P601 DOLBY NR B-C
P505 AAC 4ch EQ AMP.
P504
AAC SW. LED
P503
P502 AAC SW. AND METER
PR01 DIGITAL COUNTER
Ⓙ
REC(L) IN
REC(R) IN
GND
Ⓛ
DΩ B "H"
DΩ C "H"
DΩ OFF "H"
MPX "H"
DBX "H"
Ⓚ
P.B (L) IN
P.B (R) IN
+ 12V
− 12V
PX01 FL METER
METER SENS
P501 AAC PWB
MX01
AUDIO MUTE
METER OUT
TP
TP1
TP2


45438
1292
948
LS367A
NE652
AN6291
NE654
HA12020
LC6502C
LM6402A-075
FRONT VIEW
TA7325P
GND
IN
OUT
NJM79M12
NJM78L05A


NE652
B/C OFF
POWER SUPPLY


AN6291
CURRENT SOURCE
RMS
CCA
CCA AMP
LOGIC

D541~D546
HD20020016
1SS82

D557~D560
D548~D550
D552~D555
HD20001210
1S2473C

D551
H110049020
LN422YP

DY13~DY15
H110054020
LN340 CP

D561
HD30007020
MA1091M

Q601, Q602
HC10012270
NE652

Q603, Q604
HC10013270
NE654

Q651, Q652, Q653, Q611~Q614
HT326342A1
2SC2634(R,S)

D651
HD20001000
DIODE

Q954
HC10039020
AN6558

Q905, Q953
HC10039020
AN6291 dbx

Q906, Q907, Q955
HC10003090
4558D

QS01~QS04
HC40660080
QUAD BILATERAL SW.

Q901~Q904, Q951, Q952
HT326342A1
2SC2634(R,S)

QS51, QS53
HT107332B0
2SA733(Q,R)

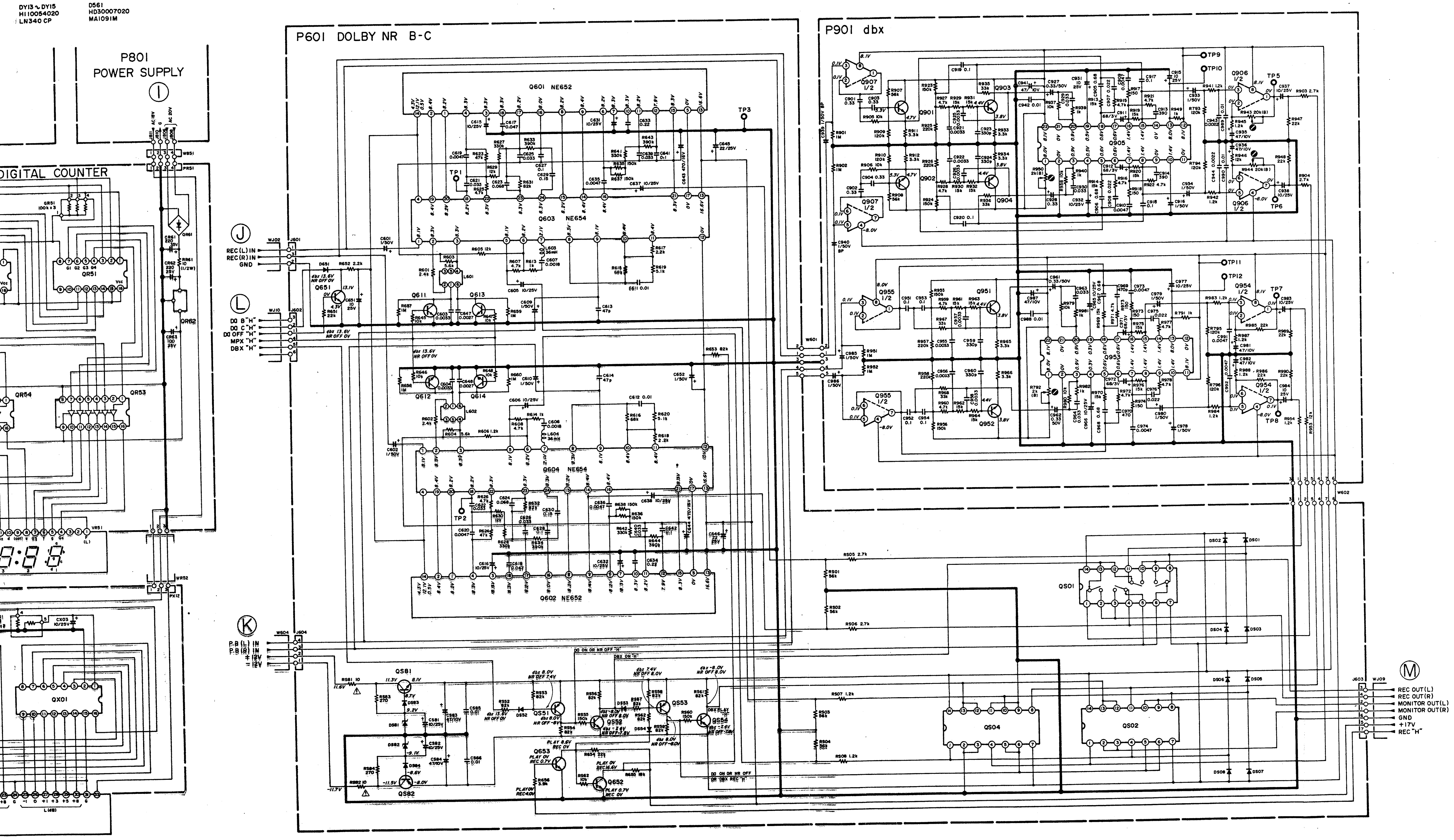
QS52, QS54
HT326342A1
2SC2634(R,S)

QS81
HT313832C0
2SC1383(R,S)

QS82
HT106832C0
2SA683(R,S)

DS01~DS08, DS52~DS54
HD2001000
DIODE

DS81, DS82
HD30029090
WZ-090


P801
POWER SUPPLY
DIGITAL COUNTER
P601 DOLBY NR B-C
P901 dbx
Q601 NE652
Q602 NE652
Q603 NE654
Q604 NE654
REC(L) IN
REC(R) IN
GND
DO B "H"
DO C "H"
DO OFF "H"
MPX "H"
DBX "H"
P.B(L) IN
P.B(R) IN
+12V
-12V
REC OUT(L)
REC OUT(R)
MONITOR OUT(L)
MONITOR OUT(R)
GND
+17V
REC "H"
TP1
TP2
TP3
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
QS01
QS02
QS04
QX01
QR51
QR53
QR54

13. TECHNICAL SPECIFICATIONS

Style	Front load
Tape Drive System	Single Capstan Drive
Cartridge	Philips type compact cassette
Track System	Compatible Stereo 4-track 2-channel
Tape Speed	4.75 cm/sec.
Heads	Rec/Play Combi. type 2 Head System
Composition	Rec/Play: Sendust Alloy Erase: Dual Gap Ferrite
Motor	Reel: DC Motor Capstan: DC Servo Motor Mechanism: DC Motor
Overall Frequency Response at -20 dB	
Normal Tape	20 Hz ~ 20 kHz
CrO$_2$ Tape	20 Hz ~ 20 kHz
Metal Tape	20 Hz ~ 22 kHz
Signal-to-Noise Ratio:	
Dolby B/C (ON)	70/75 dB
Dolby (OFF)	65 dB
dbx (ON)	90 dB
Wow and Flutter	
DIN WTD	0.06%
Outputs	
Line Level/Impedance	700 mV/2 k ohms
Headphone Level/Impedance	75 mV/70 ohms
Input (Level at 0 VU)	
Line Sensitivity/Impedance	70 mV/50 k ohms
Mic Sensitivity/Impedance	0.3 mV/10 k ohms
Fast Rewind Time	80 sec. (C-60)
ast Forward Time	80 sec. (C-60)
Power Requirements	110/120/220/240 V AC, 50/60 Hz
ower Consumption	30 W
Dimensions	
Panel Width	416 mm
Panel Height	100 mm
Depth	300 mm
Weight	6.5 kg

M2422